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FILE 'REGISTRY' ENTERED AT 16:51:21 ON 30 NOV 2007
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STRUCTURE FILE UPDATES: 29 NOV 2007 HIGHEST RN 956314-53-7
DICTIONARY FILE UPDATES: 29 NOV 2007 HIGHEST RN 956314-53-7

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(FILE 'HOME' ENTERED AT 16:09:32 ON 30 NOV 2007)

FILE 'HCAPLUS' ENTERED AT 16:09:44 ON 30 NOV 2007
L1 1 SEA ABB=ON PLU=ON US2006121352/PN
SEL RN

FILE 'REGISTRY' ENTERED AT 16:10:10 ON 30 NOV 2007
L2 12 SEA ABB=ON PLU=ON (12057-24-8/B1 OR 12190-79-3/B1 OR
12676-27-6/B1 OR 26134-62-3/B1 OR 34381-44-7/B1 OR
39377-57-6/B1 OR 553-91-3/B1 OR 554-13-2/B1 OR 7439-93-2/
B1 OR 7440-44-0/B1 OR 7789-24-4/B1 OR 9011-17-0/B1)
D SCA

L3 1 SEA ABB=ON PLU=ON "LITHIUM CARBONATE"/CN
D SCA

L4 2 SEA ABB=ON PLU=ON ("LITHIUM SULFITE (LI₂SO₃)"/CN OR
"LITHIUM SULFITE (LIHSO₃)"/CN)
D SCA

L5 1 SEA ABB=ON PLU=ON L2 AND SULFUROUS

L6 1 SEA ABB=ON PLU=ON "LITHIUM OXIDE"/CN
D SCA

L7 1 SEA ABB=ON PLU=ON "LITHIUM NITRIDE"/CN
D SCA

L8 2 SEA ABB=ON PLU=ON "LITHIUM BORATE"/CN
D SCA

L9 1 SEA ABB=ON PLU=ON "LITHIUM FLUORIDE"/CN
D SCA

L10 1 SEA ABB=ON PLU=ON L2 AND C₂H₂O₄.2LI/MF

L11 10 SEA ABB=ON PLU=ON (L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR
L9 OR L10)

L12 6 SEA ABB=ON PLU=ON L2 AND L11
 L13 1 SEA ABB=ON PLU=ON L2 AND CO/ELS
 D SCA
 L14 9 SEA ABB=ON PLU=ON (LI(L)CO)/ELS (L) 2/ELC.SUB
 L15 1 SEA ABB=ON PLU=ON 727423-19-0/RN
 D SCA

FILE 'HCAPLUS' ENTERED AT 16:26:26 ON 30 NOV 2007

L16 QUE ABB=ON PLU=ON POSITIVE?(A)(ACTIVE? OR ELECTROD##)
 OR CATHOD##
 L17 QUE ABB=ON PLU=ON (LITHIUM OR LI)(2A)(COMPOUND OR
 ADDITIVE? OR ADJUVANT? OR AUXILIAR?)
 L18 48323 SEA ABB=ON PLU=ON L11
 L19 5217 SEA ABB=ON PLU=ON L16 AND (L17 OR L18)
 L20 16954 SEA ABB=ON PLU=ON (LI OR LITHIUM OR LITHIAT?)(2A)L16
 L21 2572 SEA ABB=ON PLU=ON L19 AND L20
 L22 QUE ABB=ON PLU=ON MIX? OR BLEND? OR ADMIX? OR COMMIX?
 OR IMMIX? OR INTERMIX? OR COMPOSIT? OR FORMULAT? OR
 COMBINAT?
 L23 1359 SEA ABB=ON PLU=ON L21 AND L22
 L24 657 SEA ABB=ON PLU=ON L23 AND L18
 L25 8149 SEA ABB=ON PLU=ON L16(2A)L22
 L26 148 SEA ABB=ON PLU=ON L24 AND L25
 L27 QUE ABB=ON PLU=ON (LI OR LITHIUM)(2A)(BATTER? OR CELL)
 L28 136 SEA ABB=ON PLU=ON L26 AND L27
 D KWIC
 L29 2389 SEA ABB=ON PLU=ON L11(L)MOA/RL
 L30 13 SEA ABB=ON PLU=ON L28 AND L29
 L31 795 SEA ABB=ON PLU=ON L11(L)(ADDITIVE? OR ADJUVANT? OR
 AUXILIAR? OR MODIF?)
 L32 8 SEA ABB=ON PLU=ON L28 AND L31
 L33 18 SEA ABB=ON PLU=ON L30 OR L32
 L34 9 SEA ABB=ON PLU=ON L33 AND (PY<=2002 OR PRY<=2002 OR
 AY<=2002)
 L35 5059 SEA ABB=ON PLU=ON L13
 L36 2 SEA ABB=ON PLU=ON L15

FILE 'REGISTRY' ENTERED AT 16:40:27 ON 30 NOV 2007

L37 1 SEA ABB=ON PLU=ON L2 AND ?HEXAFLUORO?/CNS

FILE 'HCAPLUS' ENTERED AT 16:42:19 ON 30 NOV 2007

L38 4255 SEA ABB=ON PLU=ON L37
 L39 292 SEA ABB=ON PLU=ON L13 AND L38
 L40 QUE ABB=ON PLU=ON PLASTICIZ? OR RHEOLOG?
 L41 47 SEA ABB=ON PLU=ON L39 AND L40
 D KWIC 1-2
 L42 28 SEA ABB=ON PLU=ON L41 AND L16
 L43 15 SEA ABB=ON PLU=ON L42 AND L22
 L44 18 SEA ABB=ON PLU=ON (L42 OR L43) AND (C OR CARBON)
 D KWIC
 L45 0 SEA ABB=ON PLU=ON L44 AND L15
 L46 1 SEA ABB=ON PLU=ON L44 AND Li2CO3
 D KWIC
 L47 1 SEA ABB=ON PLU=ON L1 OR L46
 L48 17 SEA ABB=ON PLU=ON L33 NOT L47
 L49 17 SEA ABB=ON PLU=ON L44 NOT (L47 OR L48)

=> fil hcap
 FILE 'HCAPLUS' ENTERED AT 16:51:24 ON 30 NOV 2007

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FILE COVERS 1907 - 30 Nov 2007 VOL 147 ISS 24
FILE LAST UPDATED: 29 Nov 2007 (20071129/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 147 ibib abs hitstr hitind

L47 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2004:453546 HCAPLUS Full-text
 DOCUMENT NUMBER: 141:9634
 TITLE: Lithium ion battery **cathode**
 compositions having a lithium compound
 additive to eliminate irreversible capacity loss
 INVENTOR(S): Kejha, Joseph B.; Smith, W. Novis
 PATENT ASSIGNEE(S): USA
 SOURCE: PCT Int. Appl., 14 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004047202	A1	20040603	WO 2002-US36878	200211 18
W: CA, JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
US 2006121352	A1	20060608	US 2005-534313	200505 09
<--				
PRIORITY APPLN. INFO.:			WO 2002-US36878	W
				200211 18

AB The invention concerns **cathode compns.** for use in lithium-ion cells and other metal-ion cells, which have a lithium compound or other metal compound additives, matching the selected chemical of the cell, which additives

eliminate irreversible capacity loss. The additive is selected from Li₂CO₃, Li₂(SO₃), Li₂O, Li₃N, Li borate, Li boride, LiF, and/or Li oxalate.

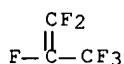
IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 12190-79-3, Cobalt lithium oxide colio2
 RL: MOA (Modifier or additive use); USES (Uses)
 (lithium ion battery **cathode compns.** having
 lithium compound additive to eliminate irreversible capacity loss)

RN 9011-17-0 HCPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4
 CMF C3 F6



CM 2

CRN 75-38-7
 CMF C2 H2 F2



RN 12190-79-3 HCPLUS
 CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M004-62
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery **cathode compn** irreversible
 capacity loss elimination
 IT Battery **cathodes**
Plasticizers
 (lithium ion battery **cathode compns.** having
 lithium compound additive to eliminate irreversible capacity loss)
 IT Secondary batteries
 (lithium; lithium ion battery **cathode compns.**
 having lithium compound additive to eliminate irreversible capacity
 loss)
 IT Secondary batteries
 (metal-ion; lithium ion battery **cathode compns**
 . having lithium compound additive to eliminate irreversible
 capacity loss)

IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (lithium ion battery **cathode compns.** having
 lithium compound additive to eliminate irreversible capacity loss)

IT 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate
 7439-93-2D, Lithium, compound 7789-24-4, Lithium fluoride, uses
 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 12057-24-8, Lithium oxide, uses 12190-79-3, Cobalt lithium
 oxide colio2 12676-27-6 26134-62-3, Lithium nitride
 34381-44-7, Sulfurous acid, lithium salt 39377-57-6, Lithium
 boride
 RL: MOA (Modifier or additive use); USES (Uses)
 (lithium ion battery **cathode compns.** having
 lithium compound additive to eliminate irreversible capacity loss)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

=> d 148 ibib abs hitstr hitind 1-17

L48 ANSWER 1 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2007:643347 HCPLUS Full-text
 DOCUMENT NUMBER: 147:119470
 TITLE: Manufacture of lithium titanate/polyacene
composite for cathode of
rechargeable lithium battery
 INVENTOR(S): Wang, Rongshun; Yu, Haiying; Xie, Haiming; Pan,
 Xiumei; Su, Zhongmin
 PATENT ASSIGNEE(S): Northeast Normal University, Peop. Rep. China
 SOURCE: Faming Zhanli Shenqing Gongkai Shuomingshu,
 12pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1978524	A	20070613	CN 2006-10131660	200611 23
PRIORITY APPLN. INFO.:			CN 2006-10131660	200611 23

AB The **composite** is manufactured by the steps of: (1) **mixing** 1 mol phenol and excess formaldehyde with NH₄OH as catalyst for 4-6 h, neutralizing, reacting for 2-3 h to obtain phenol formaldehyde resin, (2) adding expanding agent to phenol formaldehyde resin, solidifying for 10-24 h, pyrolyzing at 400-1100° under nitrogen, washing, drying, and pulverizing to obtain black polyacene conducting material with metallic luster, (3) **mixing** lithium salts and titanium oxide according to stoichiometric ratio, adding 1-20% polyacene and ball-milling for 3-10 h, and (4) sintering at 400-1100° for 8-24 h. Thus, 1 mol phenol and excess of formaldehyde were reacted in the presence of NH₄OH for 5 h, neutralized to pH=7, stirred for 2 h to give a phenol-formaldehyde copolymer, added with expanding agent, solidifying 15 h, pyrolyzed at 600° to

give a polyacene, 8% of which was mixed with lithium carbonate and anatase, milled for 3 h, heated at 800° for 12 h to give a title composite.

IT 554-13-2, Lithium carbonate 7789-24-4, Lithium fluoride, uses

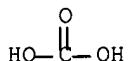
RL: MOA (Modifier or additive use); USES (Uses)

(manufacture of lithium titanate/polyacene composite for cathode of rechargeable lithium battery

)

RN 554-13-2 HCPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

RN 7789-24-4 HCPLUS

CN Lithium fluoride (LiF) (CA INDEX NAME)

F-Li

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 52

ST lithium titanate polyacene cathode rechargeable lithium battery

IT Secondary batteries

(lithium; manufacture of lithium titanate/polyacene composite for cathode of rechargeable lithium battery)

IT Phenolic resins, uses

Polyacenes

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of lithium titanate/polyacene composite for cathode of rechargeable lithium battery

)

IT Carbon black, uses

RL: MOA (Modifier or additive use); USES (Uses)

(manufacture of lithium titanate/polyacene composite for cathode of rechargeable lithium battery

)

IT 9003-35-4DP, Phenol-formaldehyde copolymer, pyrolyzed

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of lithium titanate/polyacene composite for cathode of rechargeable lithium battery

)

IT 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide 1317-70-0, Anatase 1317-80-2, Rutile 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4,

Lithium fluoride, uses 10377-51-2, Lithium iodide 10377-52-3,
Lithium phosphate

RL: MOA (Modifier or additive use); USES (Uses)
(manufacture of lithium titanate/polyacene composite for
cathode of rechargeable lithium battery
)

IT 131959-50-7, Polytetrafluoroethane

RL: POF (Polymer in formulation); PRP (Properties); TEM (Technical
or engineered material use); USES (Uses)
(manufacture of lithium titanate/polyacene composite for
cathode of rechargeable lithium battery
)

IT 9003-07-0, Polypropylene

RL: TEM (Technical or engineered material use); USES (Uses)
(manufacture of lithium titanate/polyacene composite for
cathode of rechargeable lithium battery
)

L48 ANSWER 2 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2007:545669 HCPLUS Full-text

DOCUMENT NUMBER: 147:55368

TITLE: Composite dopant modified
cathode material for secondary
lithium battery, and its
manufacture

INVENTOR(S): Zhou, Zhentao; Xie, Hui

PATENT ASSIGNEE(S): South China University of Technology, Peop. Rep.
China

SOURCE: Faming Zhanli Shenqing Gongkai Shuomingshu,
12pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1964105	A	20070516	CN 2006-10123786	200611 27

PRIORITY APPLN. INFO.: CN 2006-10123786

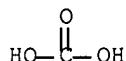
200611
27

AB The cathode material is obtained by mixing a lithium source compound, a phosphorous source compound, a Fe source compound, and a compound containing a crystalline dopant of rare earth element at a mole ratio of Li:Fe:P:M = 1:(0.97-0.995):1:(0.005-0.03), and a compound containing an amorphous doping element C (such as glucose, epoxy resin or cellobiose) 1-10% based on the total mass of the mixture; heating at 250-400° for 5-20 h; cooling; grinding to obtain a reactive precursor containing PO43-, Li+, Mn+, Fe2+ and carbon black; firing at 500-800° for 10-40 h; and cooling to obtain a LiF e(1-x)MxPO4/C composite doped cathode material.

IT 554-13-2, Lithium carbonate

RL: RCT (Reactant); RACT (Reactant or reagent)
(lithium ion battery pos.
electrode material modified by
composite doping, and preparation thereof)

RN 554-13-2 HCAPLUS
 CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery cathode
 manuf composite
 IT Battery cathodes
 (lithium ion battery pos.
 electrode material modified by composite
 doping, and preparation thereof)
 IT Epoxy resins, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (lithium ion battery pos.
 electrode material modified by composite
 doping, and preparation thereof)
 IT Secondary batteries
 (lithium; manufacture of cathode materials for
 secondary lithium batteries)
 IT 7440-44-0P, Carbon, uses 15365-14-7P 939775-69-6P, Iron
 lanthanum lithium phosphate (Fe0.99La0.01Li(PO₄)) 939775-71-0P,
 Iron lithium neodymium phosphate (Fe0.98LiNd0.02(PO₄))
 939775-72-1P, Cerium iron lithium phosphate (Ce0.03Fe0.97Li(PO₄))
 RL: IMF (Industrial manufacture); TEM (Technical or engineered
 material use); PREP (Preparation); USES (Uses)
 (lithium ion battery pos.
 electrode material modified by composite
 doping, and preparation thereof)
 IT 528-50-7, Celllobiose 12619-70-4, Cyclodextrin
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (lithium ion battery pos.
 electrode material modified by composite
 doping, and preparation thereof)
 IT 50-99-7, Glucose, reactions 516-03-0, Ferrous oxalate 537-00-8,
 Cerium acetate 546-89-4, Lithium acetate 554-13-2,
 Lithium carbonate 917-70-4, Lanthanum acetate 3094-87-9, Ferrous
 acetate 6192-13-8, Neodymium acetate 7664-38-2, Phosphoric acid,
 reactions 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0,
 Diammonium phosphate 7790-69-4, Lithium nitrate 10124-31-9,
 Ammonium phosphate 23363-14-6, Yttrium acetate
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (lithium ion battery pos.
 electrode material modified by
 composite doping, and preparation thereof)

L48 ANSWER 3 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2007:492153 HCAPLUS Full-text
 DOCUMENT NUMBER: 147:215537
 TITLE: Study on modification of carbon-doped
 LiMn0.6Fe0.4PO₄
 AUTHOR(S): Hu, Qin-qin; Zhou, Zhen-tao
 CORPORATE SOURCE: College of Materials Science and Engineering,

SOURCE:

South China University of Technology, Guangzhou,
 Guangdong, 510640, Peop. Rep. China
 Dianchi (2007), 37(1), 38-40
 CODEN: DNCHEP; ISSN: 1001-1579

PUBLISHER:

Dianchi Zazhishe

DOCUMENT TYPE:

Journal

LANGUAGE:

Chinese

AB Pure LiMn0.6Fe0.4PO₄ and LiMn0.6Fe0.4PO₄/C **composite cathode** materials for lithium-ion batteries were prepared by high-temperature solid-state reaction. The content of carbon, crystal structure, morphol. and elec. performance of the samples were investigated by dissoln. in acid, XRD, SEM and charge-discharge test. The obtained LiMn0.6Fe0.4PO₄ and LiMn0.6Fe0.4PO₄/C had pure olivine-type crystal structure. LiMn0.6Fe0.4PO₄/C **composite** with sucrose as carbon doping source had fine cycle performance and high rate performance. For the **composite**, initial specific discharge capacity was 122.3 mAh/g, and the capacity retention was 99.3% after 15 cycles when charge-discharge at 0.1 C. The initial discharge specific capacities were 121.4 mAh/g and 110.2 mAh/g when charge-discharge at 0.5 C and 1.5 C, resp.

IT 554-13-2, Lithium carbonate

RL: RCT (Reactant); RACT (Reactant or reagent)
 (study on **modification** of carbon-doped LiMn0.6Fe0.4PO₄)

RN 554-13-2 HCPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST carbon doping lithium manganese iron phosphate **cathode**
elec propertyIT Secondary **batteries**

(lithium; study on modification of carbon-doped
 LiMn0.6Fe0.4PO₄)

IT Ball milling

Calcination

Cathodes**Composites**

Electric charge

Electric discharge

Particle size

Particle size distribution

Solid state reaction

Surface structure

Thermal decomposition

(study on modification of carbon-doped LiMn0.6Fe0.4PO₄)

IT 57-50-1, Sucrose, reactions 516-03-0, Ferrous oxalate

554-13-2, Lithium carbonate 598-62-9, Manganous carbonate

7697-37-2, Nitric acid, reactions 7783-28-0, Diammonium hydrogen

phosphate

RL: RCT (Reactant); RACT (Reactant or reagent)

(study on **modification** of carbon-doped LiMn0.6Fe0.4PO₄)

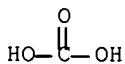
ACCESSION NUMBER: 2006:1359779 HCAPLUS Full-text
 DOCUMENT NUMBER: 146:125291
 TITLE: **Cathode plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries**
 INVENTOR(S): Dong, Jiaqiong
 PATENT ASSIGNEE(S): Peop. Rep. China
 SOURCE: Faming Zhanli Shengqing Gongkai Shuomingshu,
 12pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1881660	A	20061220	CN 2006-10087130	200606 13
PRIORITY APPLN. INFO.:			CN 2005-20109947	U 200506 17

AB The invention includes coating a first layer on the substrate the **mixture** of anode plate active material, adhesive and additives at ratio of (80-90) : (10-4) : (10-6) in weight portion to the thickness of 0.1-300 μ m. Or, coating a first layer on the substrate the **mixture** of cathode plate active material, adhesive and additives at ratio of (70-94) : (10-2) : (20-4) in weight portion to the thickness of 0.1-250 μ m. The claimed electrode plate has multiple layers of coating, formed by varying **mixture** of different electrode plate active material, adhesive and additives, on the substrate surface. Thus, changes the comprehensive properties of electrode plate, achieves closer integration between layers, enhances adhesion of interfacial particles, improves strip force of coat, ensures electrode plate property and interfacial adhesion, and meets performance requirements for batteries.

IT 554-13-2, Lithium carbonate
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives, cathode plate or anode plate
 having comprehensive properties for use in rechargeable
 lithium ion batteries)

RN 554-13-2 HCAPLUS
 CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **cathode anode plate lithium ion battery**
 IT Carbon fibers, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives, cathode plate or anode plate having

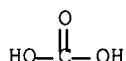
- comprehensive properties for use in rechargeable lithium ion batteries)
- IT Fluoropolymers, uses
Polyurethanes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(adhesive, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT Battery anodes
Battery **cathodes**
(**cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT Carbon fibers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(graphite; additives, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT Secondary batteries
(lithium; lithium ion, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT 7440-44-0, Activated carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(activated; additives, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT 554-13-2, Lithium carbonate 1310-65-2,
Lithium hydroxide 1344-28-1, Alumina, uses 9004-62-0,
Hydroxyethyl cellulose
RL: MOA (Modifier or additive use); USES (Uses)
(additives, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT 9004-32-4, Sodium carboxymethyl cellulose 24937-79-9,
Poly(vinylidene difluoride) 25014-41-9, Polyacrylonitrile
RL: NUU (Other use, unclassified); USES (Uses)
(adhesive, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)
- IT 11126-15-1, Lithium vanadium oxide 15365-14-7 39457-42-6,
Lithium manganese oxide 52627-24-4, Lithium cobalt oxide
RL: TEM (Technical or engineered material use); USES (Uses)
(anode plate active material, **cathode** plate or anode plate having comprehensive properties for use in rechargeable lithium ion batteries)

L48 ANSWER 5 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2006:996575 HCAPLUS Full-text
 DOCUMENT NUMBER: 145:377970
 TITLE: Method for preparing phosphate/polyacenic semiconductor **composite** as **cathode** of lithium ion **battery**
 INVENTOR(S): Wang, Rongshun; Xie, Haiming; Zhang, Lingyun;
 Pan, Xiumei; Su, Zhongmin
 PATENT ASSIGNEE(S): Northeast Normal University, Peop. Rep. China
 SOURCE: Faming Zhanli Shengqing Gongkai Shuomingshu,
 10pp.
 CODEN: CNXXEV

DOCUMENT TYPE: Patent
 LANGUAGE: Chinese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1834153	A	20060920	CN 2006-10016631	200603 02
PRIORITY APPLN. INFO.:			CN 2006-10016631	200603 02

- AB The title method includes: (1) carrying out reaction of 1 mol phenol with excess of formaldehyde under the catalysis of ammonium hydroxide at 50-90°C for 4-10 h, neutralizing with hydrochloric acid, reacting another 2-3 h to obtain water-soluble phenolic resin, adding reaming agent into phenolic resin to cure for 3-24 h, placing into a high-temperature furnace with an automatic temperature-controlling apparatus to pyrolyze at 400-1100°C at heating rate of 0.2-30°C/h under nitrogen gas atmospheric, washing the obtained product, drying, and pulverizing to obtain black and metallic luster polyacenic semiconductor (PAS) material, (2) mixing lithium salt, ferrous salt, and phosphate at stoichiometric ratio, adding PAS 1-20 weight%, and ball-milling for 5-10 h, (3) calcining at 250-350°C for 3-20 h under protective atmospheric, cooling, grinding to obtain powdery material, and (4) sintering the powdery material at 400-900° for 3-24 h to obtain the final product.
- IT 554-13-2, Lithium carbonate 7789-24-4, Lithium fluoride, uses 26134-62-3, Lithium nitride
 RL: MOA (Modifier or additive use); USES (Uses)
 (preparation of phosphate/polyacenic semiconductor composite as cathode of lithium ion battery)
- RN 554-13-2 HCPLUS
 CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)

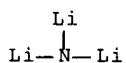


●2 Li

RN 7789-24-4 HCPLUS
 CN Lithium fluoride (LiF) (CA INDEX NAME)

F-Li

RN 26134-62-3 HCPLUS
 CN Lithium nitride (Li₃N) (CA INDEX NAME)



- CC 37-6 (Plastics Manufacture and Processing)
 Section cross-reference(s): 52
- ST phosphate polyacenic semiconductor prepn **cathode**
lithium ion battery
- IT Battery **cathodes**
 Semiconductor materials
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT Polyacenes
 RL: IMF (Industrial manufacture); PEP (Physical, engineering or
 chemical process); POF (Polymer in formulation); PYP (Physical
 process); TEM (Technical or engineered material use); PREP
 (Preparation); PROC (Process); USES (Uses)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT Phenolic resins, preparation
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT Phosphates, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT Carbon black, uses
 RL: MOA (Modifier or additive use); PEP (Physical, engineering or
 chemical process); PYP (Physical process); PROC (Process); USES
 (Uses)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT Fluoropolymers, uses
 RL: PEP (Physical, engineering or chemical process); PYP (Physical
 process); TEM (Technical or engineered material use); PROC
 (Process); USES (Uses)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT 9003-07-0, Polypropylene
 RL: PEP (Physical, engineering or chemical process); PYP (Physical
 process); TEM (Technical or engineered material use); PROC
 (Process); USES (Uses)
 (membrane; preparation of phosphate/polyacenic semiconductor
 composite as **cathode of lithium ion**
battery)
- IT 9003-35-4P, Phenol-formaldehyde copolymer
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP
 (Preparation); RACT (Reactant or reagent)
 (preparation of phosphate/polyacenic semiconductor **composite**
 as **cathode of lithium ion battery**)
- IT 516-03-0, Ferrous oxalate 554-13-2, Lithium carbonate
 1310-65-2, Lithium hydroxide 1314-56-3, Phosphorus pentaoxide,
 uses 1345-25-1, Ferrous oxide, uses 7550-35-8, Lithium bromide
 7722-76-1, Ammonium dihydrogen phosphate 7783-28-0
 7789-24-4, Lithium fluoride, uses 10045-86-0, Ferric
 phosphate 10377-51-2, Lithium iodide 10377-52-3, Lithium
 phosphate 21324-40-3, Lithium hexafluorophosphate (LiPF6)

26134-62-3, Lithium nitride

RL: MOA (Modifier or additive use); USES (Uses)

(preparation of phosphate/polyacenic semiconductor composite
as cathode of lithium ion battery)

IT 7447-41-8, Lithium chloride, uses 9002-84-0, PTFE 14013-86-6,

Ferrous nitrate

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(preparation of phosphate/polyacenic semiconductor composite
as cathode of lithium ion battery)

L48 ANSWER 6 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2006:346487 HCPLUS Full-text

DOCUMENT NUMBER: 144:453230

TITLE: Surface modified lithium ion
battery positive
electrode material and preparation
method

INVENTOR(S): Zhao, Xinbing; Tu, Jian; Cao, Gaoshao; Zhu,
Tiejun; Tu, Jiangping

PATENT ASSIGNEE(S): Zhejiang University, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 12
pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1731605	A	20060208	CN 2005-10050872	200507 27
PRIORITY APPLN. INFO.:			CN 2005-10050872	200507 27

AB The title surface modified lithium ion **battery pos. electrode** material comprises one surface impregnated modification layer of at least one **pos. electrode** active material selected from LiMO₂ (M=Co, Ni or Mn), LiNi_{1-x}Co_{1-x}O₂ (0<x<1), LiMn₂O₄ and LiNi_{1/3}Co_{1/3}Mn_{1/3}O₂; and an oxide layer covered thereon, the non-oxygen element in the surface modification layer and oxide layer is 0.1-15 wt% of **pos. electrode** active material; the oxide layer contains oxide of at least one of Mg, Al, Zn, Ni, Co, Fe, Li, Ca, K, Na, La, Nd, Ce, Sn and Ti; the surface modification layer is obtained by doping Mg, Al, Zn, Ni, Co, Fe, Li, Ca, K, Na, La, Nd, Ce, Sn or Ti in the surface of **pos. electrode** active material particles. The preparation method includes uniformly mixing additive and **pos. electrode** active material to obtain a homogenous mixture; pressing into a block under 3-20 MPa; heating to 50-400°C for 0.1-8.0 h; and heating to 200-900°C for 0.1-8.0 h to obtain the final product.

IT 12057-24-8, Lithium oxide, uses

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(surface modified lithium ion **battery**
pos. electrode material and preparation method)

RN 12057-24-8 HCPLUS

CN Lithium oxide (Li₂O) (CA INDEX NAME)

Li-O-Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72

ST surface modified lithium ion **battery pos**
electrode material prepn

IT Electrodes
 Secondary **batteries**
 Surface treatment
 (surface modified lithium ion **battery**
 pos. **electrode** material and preparation method)

IT Carbon black, uses
 Fluoropolymers, uses
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (surface modified lithium ion **battery**
 pos. **electrode** material and preparation method)

IT 105-58-8, Ethyl carbonate 616-38-6, Dimethyl carbonate
 1305-78-8, Calcium oxide, uses 1306-38-3, Cerium oxide, uses
 1307-96-6, Cobalt oxide, uses 1309-37-1, Iron oxide, uses
 1309-48-4, Magnesia, uses 1312-81-8, Lanthanum oxide 1313-59-3,
 Sodium oxide, uses 1313-97-9, Neodymium oxide 1313-99-1, Nickel
 oxide, uses 1314-13-2, Zinc oxide, uses 1332-29-2, Tin oxide
 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-89-6,
 Iron, uses 7439-91-0, Lanthanum, uses 7439-93-2, Lithium, uses
 7439-95-4, Magnesium, uses 7440-00-8, Neodymium, uses 7440-02-0,
 Nickel, uses 7440-09-7, Potassium, uses 7440-23-5, Sodium, uses
 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-45-1,
 Cerium, uses 7440-48-4, Cobalt, uses 7440-66-6, Zinc, uses
 7440-70-2, Calcium, uses 7779-88-6, Zinc nitrate 7790-69-4,
 Lithium nitrate 9002-84-0, Polytetrafluoroethylene 10141-05-6,
 Cobalt nitrate 12057-24-8, Lithium oxide, uses
 12136-45-7, Potassium oxide, uses 13463-67-7, Titanium oxide, uses
 13473-90-0, Aluminum nitrate 39457-42-6, Lithium manganese oxide
 RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
 (surface modified lithium ion **battery**
 pos. **electrode** material and preparation method)

L48 ANSWER 7 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2006:116848 HCPLUS Full-text
 DOCUMENT NUMBER: 144:174332
 TITLE: Cathode active mass for secondary
 lithium **battery**, its
 manufacture, and its usage
 INVENTOR(S): Sun, Yucheng; Chen, Liquan; Huang, Xuejie
 PATENT ASSIGNEE(S): Institute of Physics, Chinese Academy of
 Sciences, Peop. Rep. China
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 20
 pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent
 LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

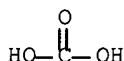
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1595687	A	20050316	CN 2003-156806	200309 08
PRIORITY APPLN. INFO.:			CN 2003-156806	200309 08

AB The **cathode** active mass is $\text{LiMn}_{2-z}\text{M}_z\text{O}_4$ ($0 \leq z \leq 0.5$, and M=Li, Mg, Co, Ni, Fe, Al, Sr, Cr, Ga, Cu, and/or Zn) and has a pos. spinel structure. The active mass is prepared by **mixing** a 1.0-1.0M solution of soluble Mn and M salts with a 2.0-8.0M alkaline solution and a 0.1-2M additive solution, stirring the **mixture**, filtering, washing the precipitate, and drying the precipitate to obtain a precursor; adding the precursor to a 0.1-2M solution of a soluble sat of a modifier at a modifier:precursor mol ratio (0.1-0.3):1, stirring, adding a complexing agent at a complexing agent:modifier mol ratio (0.5-2):1 to the **mixture**, heating under stirring at 50-90° to evaporate water to obtain a modifier coated precursor; **mixing** the modifier coated precursor and a Li salt at t mol ratio 2:(1.0-1.1), adding 20-80% water to a slurry with an adjusted viscosity, and mist spraying the obtain 1-100 μm solid particles, and firing the particles at 400-950° for 1-48 h. The modifier coated precursor may also be obtained by adding a precipitating agent to the precursor-modifier **mixture** to adjust the slurry to pH 7, heating under stirring at 50-90°, and filtering the precipitate

IT 554-13-2, Lithium carbonate 7789-24-4, Lithium fluoride, uses 12057-24-8, Lithium oxide, uses
 RL: **MOA (Modifier or additive use); USES (Uses)**
 (comps. and manufacture of pos. spinel type substituted lithium manganese oxide for secondary **lithium battery cathodes**)

RN 554-13-2 HCAPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

RN 7789-24-4 HCAPLUS
 CN Lithium fluoride (LiF) (CA INDEX NAME)

F-Li

RN 12057-24-8 HCAPLUS
 CN Lithium oxide (Li₂O) (CA INDEX NAME)

Li-O-Li

IC ICM H01M004-48
 ICS H01M004-04; C01D015-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST pos spinel structure lithium manganese oxide
cathode manuf
 IT Battery **cathodes**
 (**compns.** and manufacture of pos. spinel type substituted
 lithium manganese oxide for secondary **lithium**
 battery cathodes)
 IT 874383-59-2P, Lithium manganese oxide (Li_{1.05}Mn_{1.98}O₄)
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (**Cathode** active mass for secondary **lithium**
 battery, its manufacture, and its usage)
 IT 12031-75-3P, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄)
 12057-17-9P, Lithium manganese oxide (LiMn₂O₄) 130260-87-6P,
 Chromium lithium manganese oxide (Cr_{0.1}LiMn_{1.9}O₄) 130732-38-6P,
 Iron lithium manganese oxide (Fe_{0.2}LiMn_{1.8}O₄) 136479-29-3P,
 Calcium lithium manganese oxide (Ca_{0.1}LiMn_{1.9}O₄) 136479-30-6P,
 Lithium manganese zinc oxide (LiMn_{1.9}Zn_{0.1}O₄) 136479-37-3P,
 Lithium magnesium manganese oxide (LiMg_{0.2}Mn_{1.8}O₄) 145896-59-9P,
 Aluminum lithium manganese oxide (Al_{0.1}LiMn_{1.9}O₄) 146956-26-5P,
 Cobalt lithium manganese oxide (Co_{0.1}LiMn_{1.9}O₄) 176979-23-0P,
 Lithium manganese oxide (Li_{1.15}Mn_{1.85}O₄) 189218-41-5P, Lithium
 manganese nickel oxide (LiMn_{1.95}Ni_{0.05}O₄) 201857-53-6P, Copper
 lithium manganese oxide (Cu_{0.05}LiMn_{1.95}O₄) 216005-44-6P, Lithium
 magnesium manganese oxide (LiMg_{0.05}Mn_{1.95}O₄) 220516-32-5P,
 Aluminum lithium manganese oxide (Al_{0.05}LiMn_{1.95}O₄) 220516-34-7P,
 Aluminum lithium manganese oxide (Al_{0.15}LiMn_{1.85}O₄) 371773-17-0P,
 Lithium magnesium manganese nickel oxide (LiMg_{0.1}Mn_{1.5}Ni_{0.4}O₄)
 799283-36-6P, Lithium manganese strontium oxide (LiMn_{1.95}Sr_{0.05}O₄)
 874383-60-5P, Chromium lithium manganese nickel oxide
 (Cr_{0.25}LiMn_{1.5}Ni_{0.25}O₄) 874383-62-7P, Cobalt lithium manganese
 nickel oxide (Co_{0.2}LiMn_{1.5}Ni_{0.3}O₄)
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (**compns.** and manufacture of pos. spinel type substituted
 lithium manganese oxide for secondary **lithium**
 battery cathodes)
 IT 554-13-2, Lithium carbonate 1308-04-9, Cobalt oxide
 (Co₂O₃) 1308-06-1, Cobalt oxide (Co₃O₄) 1309-48-4, Magnesia,
 uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses
 7784-30-7, Aluminum phosphate (AlPO₄) 7789-24-4, Lithium
 fluoride, uses 10377-52-3, Lithium phosphate (Li₃PO₄)
 12003-67-7, Lithium aluminate (LiAlO₂) 12057-24-8, Lithium
 oxide, uses 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 13463-67-7, Titania, uses 99489-75-5, Chromium lithium oxide
 (Cr₂LiO₄)
 RL: MOA (Modifier or additive use); USES (Uses)
 (**compns.** and manufacture of pos. spinel type substituted
 lithium manganese oxide for secondary **lithium**
 battery cathodes)
 IT 68-04-2, Trisodium citrate 77-92-9, Citric acid, uses 87-69-4,
 Tartaric acid, uses 1336-21-6, Ammonium hydroxide 7722-84-1,
 Hydrogen peroxide, uses
 RL: NUU (Other use, unclassified); USES (Uses)

(compns. and manufacture of pos. spinel type substituted lithium manganese oxide for secondary lithium battery cathodes)

L48 ANSWER 8 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2005:522870 HCPLUS Full-text
 DOCUMENT NUMBER: 143:62637
 TITLE: **Positive electrode auxiliary active substance for nonaqueous electrolyte secondary battery, Positive electrode auxiliary active substance for nonelectrolyte secondary battery, positive electrode active substance for the battery, the battery, and manufacture thereof**
 INVENTOR(S): Sakamoto, Takako; Eto, Hiroyasu
 PATENT ASSIGNEE(S): Nichia Chemical Industries Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 28 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005158612	A	20050616	JP 2003-397886	200311 27
PRIORITY APPLN. INFO.:			JP 2003-397886	200311 27

AB Disclosed is a pos. **electrode auxiliary active substance for a nonaq. electrolyte secondary battery which is made from Li transition metal composite oxide having spinel structure, on the surface of which has B, F, and Mg whose concns. are higher on the surface than those in the inside. Further, the Li transition metal composite oxide has Li at 16c site of the crystal structure.**

IT 12057-24-8, Lithium oxide, uses
 RL: DEV (Device component use); USES (Uses)
 (composite metal oxide; pos.
electrode auxiliary active substance for nonaq.
electrolyte Li secondary battery)

RN 12057-24-8 HCPLUS
 CN Lithium oxide (Li₂O) (CA INDEX NAME)

Li—O—Li

IC ICM H01M004-58
 ICS H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST pos **electrode auxiliary active substance nonaq**
electrolyte secondary battery; lithium secondary
battery transition metal composite oxide
 IT Secondary batteries
 (lithium; pos. **electrode**

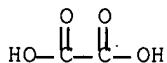
- auxiliary active substance for nonaq. electrolyte
Li secondary battery)
- IT Battery electrodes
(pos. electrode auxiliary active substance
for nonaq. electrolyte Li secondary battery)
- IT Transition metal oxides
RL: DEV (Device component use); USES (Uses)
(pos. electrode auxiliary active substance
for nonaq. electrolyte Li secondary battery)
- IT 12057-24-8, Lithium oxide, uses
RL: DEV (Device component use); USES (Uses)
(composite metal oxide; pos.
electrode auxiliary active substance for nonaq.
electrolyte Li secondary battery)
- IT 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7782-41-4,
Fluorine, uses
RL: DEV (Device component use); USES (Uses)
(pos. electrode auxiliary active substance
for nonaq. electrolyte Li secondary battery)

L48 ANSWER 9 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2005:209774 HCPLUS Full-text
 DOCUMENT NUMBER: 142:282844
 TITLE: Manufacture of lithium manganese nickel
composite oxide, and cathode
active mass for secondary nonaqueous electrolyte
battery which uses the oxide
 INVENTOR(S): Sasaoka, Hideo; Oda, Shuhei; Yoshikawa, Shinichi
 PATENT ASSIGNEE(S): Sumitomo Metal Mining Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005060162	A	20050310	JP 2003-291689	200308 11
PRIORITY APPLN. INFO.:			JP 2003-291689	200308 11

- AB The oxide, having a spinel structure and a general formula of $\text{Li}_{1+x}\text{Mn}_{2-y-x}\text{Ni}_y\text{O}_4$ ($x = -0.05-0.1$; and $y = 0.45-0.55$), is manufactured by preparing a mixed aqueous solution by dissolving a water-soluble Li salt, $\text{Ni}(\text{NO}_3)_2$, and $\text{Mn}(\text{NO}_3)_2$ in H_2O ; adding a metal ion-free nonionic water-soluble organic compound to the mixed aqueous solution until the concentration of the organic compound becomes 0.1-0.2 M (vs. total moles of Li, Mn, and Ni); synthesizing a Li Mn Ni composite oxide precursor by heat removing water and nitrate group in the mixed aqueous solution at $\geq 150^\circ$; and heat treating the precursor in an O atmospheric
- IT 553-91-3, Lithium oxalate
RL: MOA (Modifier or additive use); USES (Uses)
(manufacture of lithium manganese nickel composite oxides
for secondary lithium battery
cathodes)

RN 553-91-3 HCAPLUS
 CN Ethanedioic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

IC ICM C01G053-00
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary **battery cathode lithium**
 manganese nickel **composite** oxide manuf
 IT Battery **cathodes**
 (manufacture of lithium manganese nickel **composite**
 oxides for secondary **lithium battery**
 cathodes)
 IT 12031-75-3P, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄)
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (manufacture of lithium manganese nickel **composite** oxides
 for secondary **lithium battery**
 cathodes)
 IT 64-19-7, Acetic acid, uses 77-92-9, Citric acid, uses 144-62-7,
 Oxalic acid, uses 553-91-3, Lithium oxalate
 RL: MOA (Modifier or additive use); USES (Uses)
 (manufacture of lithium manganese nickel **composite** oxides
 for secondary **lithium battery**
 cathodes)

L48 ANSWER 10 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:292166 HCAPLUS Full-text
 DOCUMENT NUMBER: 136:328120
 TITLE: Nonaqueous electrolyte secondary **battery**
 with **lithium complex oxide**
positive electrode mix
 additionally containing lithium carbonate for
 improved charge-discharge cycle characteristic
 at high temperature
 INVENTOR(S): Hosoya, Mamoru; Fukushima, Gen
 PATENT ASSIGNEE(S): Sony Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

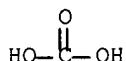
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002117843	A	20020419	JP 2000-306875	200010 05
PRIORITY APPLN. INFO.:			JP 2000-306875	200010

AB A nonaq. electrolyte secondary battery comprises a $LixFe1-yMyPO_4$ (M is Mn, Cr, Co, Cu, Ni, V, Mo, Ti, Zn, Al, Ga, Mg, B, and/or Nb; $x = 0.05-1.2$, $y \leq 0.8$), pos. electrode active mix addnl. containing Li_2CO_3 . The battery has improved charge-discharge cycle characteristic at high temperature

IT 554-13-2, Lithium carbonate
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. containing lithium carbonate for improved charge-discharge cycle characteristic at high temperature)

RN 554-13-2 HCPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

IC ICM H01M004-58
 ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST olivine crystal structure pos electrode
 lithium carbonate battery

IT Battery cathodes
 (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. containing lithium carbonate for improved charge-discharge cycle characteristic at high temperature)

IT Olivine-group minerals
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. containing lithium carbonate for improved charge-discharge cycle characteristic at high temperature)

IT 15365-14-7, Iron lithium phosphate ($FeLiPO_4$) 407629-83-8
 407629-87-2 407629-90-7 407629-95-2 407630-01-7 407630-05-1
 407630-10-8 407630-14-2 407630-25-5, Aluminum iron lithium phosphate ($Al_{0.7}Fe_{0.3}Li(PO_4)$) 407630-29-9, Gallium iron lithium phosphate ($Ga_{0.7}Fe_{0.3}Li(PO_4)$) 407630-35-7 407630-40-4, Boron iron lithium phosphate ($B_{0.75}Fe_{0.25}Li(PO_4)$) 407630-46-0
 412267-84-6, Iron lithium zinc phosphate ($Fe_{0.3}LiZn_{0.7}(PO_4)$)
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. containing lithium carbonate for improved charge-discharge cycle characteristic at high temperature)

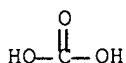
IT 554-13-2, Lithium carbonate
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte secondary battery with lithium complex oxide pos. electrode mix addnl. containing lithium carbonate for improved

charge-discharge cycle characteristic at high temperature)

L48 ANSWER 11 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2001:796626 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:346884
 TITLE: Secondary nonaqueous electrolyte batteries
 INVENTOR(S): Tabuchi, Toru
 PATENT ASSIGNEE(S): Japan Storage Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001307774	A	20011102	JP 2000-121720	200004 21
PRIORITY APPLN. INFO.:			JP 2000-121720	200004 21

AB The batteries use **cathodes** containing Li₂CO₃, and electrolyte solns. containing LiPF₆ in addition to LiBF₄, Li amide salt, or Li(C₂F₅)_nPF_{6-n} (n = 1-6).
 IT 554-13-2, Lithium carbonate
 RL: MOA (Modifier or additive use); USES (Uses)
 (cathodes containing lithium carbonate for secondary lithium batteries)
 RN 554-13-2 HCAPLUS
 CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

IC ICM H01M010-40
 ICS H01M010-40; H01M004-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary battery cathode lithium
 carbonate additive; lithium hexafluorophosphate
 electrolyte additive secondary lithium
 battery
 IT Battery cathodes
 (cathodes containing lithium carbonate for secondary lithium batteries)
 IT Battery electrolytes
 (electrolyte solns. containing lithium hexafluorophosphate and other lithium salts for secondary lithium batteries)
 IT Secondary batteries
 (lithium; secondary lithium batteries)

with lithium carbonate containing **cathode** and
mixed salt electrolytes containing lithium
hexafluorophosphate)

- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
RL: DEV (Device component use); USES (Uses)
(**cathodes** containing lithium carbonate for
secondary lithium batteries)
- IT 554-13-2, Lithium carbonate
RL: MOA (Modifier or additive use); USES (Uses)
(**cathodes** containing lithium carbonate for
secondary lithium batteries)
- IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate
14283-07-9, Lithium fluoroborate 21324-40-3, Lithium
hexafluorophosphate 90076-65-6 206057-04-7
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. containing lithium hexafluorophosphate and other
lithium salts for secondary lithium batteries
)

L48 ANSWER 12 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:479599 HCAPLUS Full-text

DOCUMENT NUMBER: 135:79438

TITLE: Lithium borate doped lithium manganese oxide,
secondary lithium battery,
and manufacture of the oxide

INVENTOR(S): Yamaguchi, Munetoshi

PATENT ASSIGNEE(S): Mitsui Mining and Smelting Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001180938	A	20010703	JP 1999-372524	199912 28
JP 2005112710	A	20050428	JP 2003-427056	200312 24
JP 2005112711	A	20050428	JP 2003-427057	200312 24
JP 3763537	B2	20060405		
PRIORITY APPLN. INFO.:			JP 1999-372524	A3 199912 28

AB The oxide is $\text{Li}_{x}\text{Mn}_{2-y}\text{MyO}_4\cdot n\text{LiB}_4\text{O}_7$, where M = Al and/or Mg, $1 < x \leq 1.1$, $0 < y \leq 0.2$, and $0.002 \leq n \leq 0.05$. Secondary **Li batteries** use the oxide for **cathodes**. The oxide is prepared by using Li borate as B source.

- IT 12007-60-2, Lithium borate (Li₂B₄O₇)
RL: MOA (Modifier or additive use); USES (Uses)
(comps. and manufacture of lithium borate doped lithium
manganese oxide for secondary lithium battery
cathodes)

RN 12007-60-2 HCAPLUS

CN Boron lithium oxide (B4Li2O7) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	7	17778-80-2
B	4	7440-42-8
Li	2	7439-93-2

IC ICM C01G045-00

ICS C01B035-12; H01M004-02; H01M004-58; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode boron lithium

manganese oxide compn manuf; aluminum boron
 lithium manganese oxide battery cathode;
 magnesium boron lithium manganese oxide battery
 cathode

IT Battery cathodes

(comps. and manufacture of lithium borate doped lithium
 manganese oxide for secondary lithium battery
 cathodes)

IT 145896-59-9P, Aluminum lithium manganese oxide (Al0.1LiMn1.904)

204199-32-6P, Aluminum lithium manganese oxide

(Al0.05Li1.05Mn1.95O4) 267225-96-7P, Aluminum lithium manganese

oxide (Al0.2Li1.05Mn1.804) 347148-85-0P, Aluminum lithium

manganese oxide (Al0.1Li1.05Mn1.904) 347148-86-1P, Lithium

magnesium manganese oxide (Li1.05Mg0.1Mn1.904) 347148-87-2P,

Aluminum lithium manganese oxide (Al0.1Li1.02Mn1.904)

347148-88-3P, Aluminum lithium manganese oxide (Al0.1Li1.1Mn1.904)

347148-89-4P, Lithium magnesium manganese oxide (Li1.15Mg0.1Mn1.904)

347148-90-7P, Aluminum lithium manganese oxide

(Al0.25Li1.05Mn1.75O4)

RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)

(comps. and manufacture of lithium borate doped lithium
 manganese oxide for secondary lithium battery
 cathodes)

IT 12007-60-2, Lithium borate (Li2B4O7)

RL: MOA (Modifier or additive use); USES (Uses)

(comps. and manufacture of lithium borate doped lithium
 manganese oxide for secondary lithium battery
 cathodes)

L48 ANSWER 13 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:137524 HCPLUS Full-text

DOCUMENT NUMBER: 134:150145

TITLE: Batteries with lithium-based
 active material having extended cycle life

INVENTOR(S): Barker, Jeremy

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 40 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001013443 A2 20010222 WO 2000-US18735

200007
10

WO 2001013443 A3 20020117

W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,
 CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,
 ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
 LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,
 SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ,
 VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
 BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 6468695 B1 20021022 US 1999-376914

199908
18

US 2003082451 A1 20030501 US 2002-238862

200209
09

PRIORITY APPLN. INFO.: US 1999-376914 A1

199908
18

AB A method of treating spinel lithium manganese oxide (LMO) particles comprise the steps: (a) forming a **mixture** comprising the LMO particles and LiOH and (b) heating the **mixture** for a time and at a temperature sufficient to decompose the LiOH, and to provide treated spinel LMO characterized by reduced surface area and increased lithium content as compared to untreated spinel LMO. In one embodiment, the invention provides a novel **composition** which is stabilized against decomposition when used as an active material for an electrochem. cell. The active material of the present invention comprises particles of spinel LMO enriched with lithium by a decomposition product of lithium hydroxide forming a part of each of the LMO particles. The spinel LMO product formed by the decomposition of lithium hydroxide in the presence of the LMO is characterized by a reduced surface area and increased capacity retention (reduced capacity fading) as compared to the initial, non-treated, non-enriched spinel. In another aspect, the treated spinel LMO product is combined with lithium carbonate in a **cathode mixture**

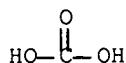
IT 554-13-2, Lithium carbonate

RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(**batteries** with lithium-based active material
having extended cycle life)

RN 554-13-2 HCAPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

IC ICM H01M004-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** lithium manganese oxide spinelIT Battery **cathodes**

- Heat treatment
 (batteries with lithium-based active material having extended cycle life)
- IT Fluoro rubber
 RL: TEM (Technical or engineered material use); USES (Uses)
 (hexafluoropropene-vinylidene fluoride, binder; batteries with lithium-based active material having extended cycle life)
- IT Secondary batteries
 (lithium; batteries with lithium-based active material having extended cycle life)
- IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3, Lithium hexafluorophosphate 39457-42-6, Lithium manganese oxide 304891-46-1, Lithium manganese oxide Li1.08-1.2Mn1.8-1.9204
 RL: DEV (Device component use); USES (Uses)
 (batteries with lithium-based active material having extended cycle life)
- IT 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide
 RL: DEV (Device component use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (batteries with lithium-based active material having extended cycle life)
- IT 7440-44-0, Carbon, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (batteries with lithium-based active material having extended cycle life)

L48 ANSWER 14 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:172059 HCPLUS Full-text

DOCUMENT NUMBER: 130:225329

TITLE: Cathode modification for improved performance of rechargeable lithium/composite polymer electrolyte-pyrite battery

AUTHOR(S): Strauss, E.; Golodnitsky, D.; Peled, E.

CORPORATE SOURCE: School of Chemistry, Tel Aviv University, Tel Aviv-Jaffa, 69978, Israel

SOURCE: Electrochemical and Solid-State Letters (1999), 2(3), 115-117

CODEN: ESLEF6; ISSN: 1099-0062

PUBLISHER: Electrochemical Society

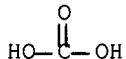
DOCUMENT TYPE: Journal

LANGUAGE: English

AB A process of cathode modification involving coating of the reduced (discharged) cathode particles by a very thin ion-conductive protective film, known as the solid electrolyte interphase (SEI) has been developed. The SEI is electrochem. formed by overdischarge of the cell. The formation of SEI on cathodes is designed to provide protection to the cathode active material in fully charged and/or fully discharged states and to improve the performance characteristics of the battery. Over 500 100% depth of discharge cycles (at C/3 rate), with a capacity fading rate of less than 0.1%/cycle were carried out in small (1 cm² area) laboratory prototype cells with 7 µm thick modified cathodes. This cathode coating enables the increase of the charge rate up to C/2 with no adverse effects. The anticipated specific energy of the battery employing an optimized 10 µm thick pyrite composite cathode is 130 Wh/kg and its projected continuous specific power is about 300 W/kg on the basis of 5

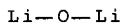
mA/cm² discharge tests. XPS measurements indicate that this **cathode** protective film contains Li₂CO₃ and Li₂O.

- IT 554-13-2, Lithium carbonate 12057-24-8, Lithia,
formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(protective film; **cathode modification** for
improved performance of rechargeable lithium/**composite**
polymer electrolyte-pyrite battery)
- RN 554-13-2 HCAPLUS
- CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

- RN 12057-24-8 HCAPLUS
CN Lithium oxide (Li₂O) (CA INDEX NAME)



- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST lithium **composite** polymer electrolyte pyrite battery
- IT Battery **cathodes**
Battery electrolytes
(**cathode** modification for improved performance of
rechargeable lithium/**composite** polymer
electrolyte-pyrite battery)
- IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(**cathode** modification for improved performance of
rechargeable lithium/**composite** polymer
electrolyte-pyrite battery)
- IT Secondary batteries
(lithium; **cathode** modification for improved
performance of rechargeable lithium/**composite** polymer
electrolyte-pyrite battery)
- IT 7439-93-2, Lithium, uses 10377-51-2, Lithium
iodide 12068-85-8, Iron sulfide fes₂ 25322-68-3, Peo
RL: DEV (Device component use); USES (Uses)
(**cathode** modification for improved performance of
rechargeable lithium/**composite** polymer
electrolyte-pyrite battery)
- IT 96-49-1, Ethylene carbonate
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(**cathode** modification for improved performance of
rechargeable lithium/**composite** polymer
electrolyte-pyrite battery)
- IT 1344-28-1, Alumina, uses
RL: MOA (Modifier or additive use); USES (Uses)

(**cathode** modification for improved performance of rechargeable lithium/**composite** polymer electrolyte-pyrite battery)

IT 554-13-2, Lithium carbonate 12057-24-8, Lithia, formation (nonpreparative)
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative) (protective film; **cathode** modification for improved performance of rechargeable lithium/**composite** polymer electrolyte-pyrite battery)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L48 ANSWER 15 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1998:479119 HCPLUS Full-text

DOCUMENT NUMBER: 129:111372

TITLE: Secondary nonaqueous electrolyte batteries

INVENTOR(S): Endo, Takuya; Takahashi, Kimio

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10188953	A	19980721	JP 1996-359248	199612 27
JP 3562187	B2	20040908		
US 6022641	A	20000208	US 1997-996320	199712 22
PRIORITY APPLN. INFO.:			JP 1996-359248	A 199612 27

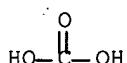
AB The **batteries** use Li or Li containing anodes and Mn oxide or Li Mn oxide **cathodes**, where the **cathode** active mass **mixture** contains, in dried state, 0.5-20% alkali metal carbonate.

IT 554-13-2, Lithium carbonate

RL: MOA (Modifier or additive use); USES (Uses)
 (manganese oxide and lithium manganese oxide
cathode active mass containing alkali metal carbonate for
 batteries)

RN 554-13-2 HCPLUS

CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



IC ICM H01M004-02
 ICS H01M004-62; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery cathode
 carbonate additive; lithium battery
 cathode alkali metal carbonate; manganese oxide
 cathode alkali metal carbonate
 IT Secondary batteries
 (lithium; manganese oxide and lithium
 manganese oxide cathode active mass containing alkali metal
 carbonate for batteries)
 IT 1313-13-9, Manganese dioxide, uses 12057-17-9, Lithium manganese
 oxide (LiMn₂O₄)
 RL: DEV (Device component use); USES (Uses)
 (manganese oxide and lithium manganese oxide
 cathode active mass containing alkali metal carbonate for
 batteries)
 IT 497-19-8, Sodium carbonate, uses 554-13-2, Lithium
 carbonate
 RL: MOA (Modifier or additive use); USES (Uses)
 (manganese oxide and lithium manganese oxide
 cathode active mass containing alkali metal carbonate for
 batteries)

L48 ANSWER 16 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1998:219958 HCPLUS Full-text
 DOCUMENT NUMBER: 128:297099
 TITLE: Manufacture of nonaqueous solvent
 lithium secondary batteries
 and same batteries
 INVENTOR(S): Fujiwara, Masashi; Yamada, Shuji; Shirakawa,
 Yasuhiro; Ikazaki, Yoshiyuki; Sato, Masaji
 PATENT ASSIGNEE(S): Toshiba Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10092429	A	19980410	JP 1996-243788	199609 13
JP 2971403	B2	19991108	JP 1996-243788	199609 13

PRIORITY APPLN. INFO.:

AB In manufacture of the batteries using cathodes containing Li-containing Ni oxides or Li Mn oxides, mixts. of Li compds. and Ni compds. and/or Mn compds. are heat treated in O₂-containing atmospheric at 670-950° to give the cathode active mass. The title batteries using cathodes containing LiNiO₂ grains and LiMn₂O₄ grains, whereas a part of Ni in LiNiO₂ and Mn in LiMn₂O₄ may have been substituted with another elements, and the grains have 0.1-1.5 weight% of Li oxide layer coatings. Preferably, Co, Mn, B, Al, and/or Li are substituted with Ni, and/or Co, Ni, B, Al, and/or Li are substituted with Mn. The

batteries inhibit locally overdischarging and overcharging in repeated charge-discharge cycling, and show long cycling life.

IT 12057-24-8P, Lithium oxide (li₂O), uses
 RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (coatings on Li **mixed** oxide grains in **cathodes**
 ; preparation of Li **mixed** oxide **cathodes**
 for Li secondary batteries)

RN 12057-24-8 HCPLUS

CN Lithium oxide (Li₂O) (CA INDEX NAME)

Li-O-Li

IC ICM H01M004-58
 ICS H01M004-02; H01M004-04; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery cathode **mixed**
 oxide; nickel lithium oxide **battery**
cathode; manganese lithium oxide **battery**
cathode

IT Battery **cathodes**
 (preparation of Li **mixed** oxide **cathodes**
 for Li secondary batteries)

IT 12031-65-1P, Lithium nickel oxide (linio₂) 12057-17-9P, Lithium manganese oxide (LiMn₂O₄) 101920-93-8P, Cobalt lithium nickel oxide (Co0.5LiNi0.5O₂) 145423-77-4P, Lithium manganese borate oxide (LiMn_{1.9}(BO₃)_{0.10}3.7) 145896-59-9P, Aluminum lithium manganese oxide (Al_{0.1}LiMn_{1.9}O₄) 146956-26-5P, Cobalt lithium manganese oxide (Co0.1LiMn_{1.9}O₄) 147787-62-0P, Lithium manganese nickel oxide (LiMn_{1.9}Ni0.1O₄) 193214-24-3P, Aluminum cobalt lithium nickel oxide (Al_{0.05}Co_{0.15}LiNi0.8O₂) 197389-20-1P, Lithium nickel borate oxide (LiNi0.97(BO₃)_{0.03}O_{1.91}) 197389-21-2P, Aluminum lithium nickel oxide (Al_{0.03}LiNi0.97O₂) 206279-78-9P, Lithium nickel oxide (Li_{1.1}Ni0.9O₂) 206279-79-0P, Cobalt lithium nickel oxide (Co_{0.2}LiNi0.8O₄)
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (cathodes; preparation of Li **mixed** oxide **cathodes** for Li secondary batteries)

IT 12057-24-8P, Lithium oxide (li₂O), uses
 RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
 (coatings on Li **mixed** oxide grains in **cathodes**
 ; preparation of Li **mixed** oxide **cathodes**
 for Li secondary batteries)

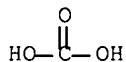
IT 1310-65-2, Lithium hydroxide 7439-96-5, Manganese, processes
 12054-48-7, Nickel hydroxide [Ni(OH)₂]
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (in preparation of Li **mixed** oxide **cathodes**
 for Li secondary batteries)

L48 ANSWER 17 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1995:229520 HCPLUS Full-text
 DOCUMENT NUMBER: 122:35186
 TITLE: Secondary nonaqueous-electrolyte batteries with

INVENTOR(S): improved oxide cathodes
 Uehara, Mayumi; Noma, Toshuki; Kurokawa,
 Hiroshi; Saito, Toshihiko; Nishio, Koji
 PATENT ASSIGNEE(S): Sanyo Electric Co, Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 06243870	A	19940902	JP 1993-47316	199302 12
JP 3054511	B2	20000619		
PRIORITY APPLN. INFO.:			JP 1993-47316	199302 12

AB Secondary Li batteries use $\text{Li}_{x}\text{Ni}_{1-y}\text{Co}_{y}\text{O}_w$ (I , $0 < x < 1.3$; $0 \leq y \leq 0.5$; $1.8 \leq w \leq 2.2$) cathodes containing Li_2O , LiOH , LiNO_3 , Li_2CO_3 , Li halides, Li_2S , Li acetate, and/or Li_2SO_4 , preferably at 3-30 mol (calculated as Li)/100 mol I .
 IT 554-13-2, Lithium carbonate 12057-24-8,
 Lithium oxide, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (lithium compound additives for
 mixed oxide cathodes in secondary
 lithium batteries)
 RN 554-13-2 HCPLUS
 CN Carbonic acid, lithium salt (1:2) (CA INDEX NAME)



●2 Li

RN 12057-24-8 HCPLUS
 CN Lithium oxide (Li_2O) (CA INDEX NAME)

Li—O—Li

IC ICM H01M004-58
 ICS H01M004-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery oxide cathode
 additive; oxide cathode lithium compd
 additive
 IT Cathodes
 (battery, lithium compound

- additives for mixed oxide cathodes in secondary lithium batteries)
- IT 116327-69-6P, Cobalt lithium nickel oxide (Co0.1LiNi0.9O2)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); USES (Uses)
 (lithium compound additives for mixed oxide cathodes in secondary lithium batteries)
- IT 159845-85-9, Cobalt lithium nickel oxide (Co0-0.5Li0-1.3Ni0.5-101.8-2.2)
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (lithium compound additives for mixed oxide cathodes in secondary lithium batteries)
- IT 546-89-4, Lithium acetate 554-13-2,
 Lithium carbonate 1310-65-2, Lithium hydroxide
 7790-69-4, Lithium nitrate 10377-48-7, Lithium sulfate 12057-24-8, Lithium oxide, uses 12136-58-2,
 Lithium sulfide
 RL: MOA (Modifier or additive use); USES (Uses)
 (lithium compound additives for mixed oxide cathodes in secondary lithium batteries)

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- L49 ANSWER 1 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2004:575192 HCPLUS Full-text
 DOCUMENT NUMBER: 141:382000
 TITLE: Preparation of porous, chemically cross-linked, PVdF-based gel polymer electrolytes for rechargeable lithium batteries
 AUTHOR(S): Cheng, C. L.; Wan, C. C.; Wang, Y. Y.
 CORPORATE SOURCE: Department of Chemical Engineering, National Tsing-Hua University, Hsinchu, 300, Taiwan
 SOURCE: Journal of Power Sources (2004), 134(2), 202-210
 CODEN: JPSODZ; ISSN: 0378-7753
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB This study reports the development of a new system of porous, chemical cross-linked, gel polymer electrolytes based on poly(vinylidene fluoride-co-hexafluoropropylene) (PVdF-HFP) copolymer as a polymer matrix, polyethylene glycol (PEG) as a plasticizer, and polyethylene glycol dimethacrylate (PEGDMA) as a chemical crosslinking oligomer. The electrolytes are prepared by a combination of controlled evaporation and thermal polymerization of PEGDMA. PVdF-HFP/PEG/PEGDMA gel polymer electrolytes with a composition of 5/3/2 exhibit both high ambient ionic conductivity, viz., >1 mS cm⁻¹, and a high tensile modulus of 52 MPa, because of their porous and network structures. All the blends of electrolytes are electrochem. stable up to 5 V vs. Li/Li⁺ in the presence of 1 M LiPF₆/ethylene carbonate-diethyl carbonate (EC-DEC). With these polymer electrolytes, rechargeable lithium batteries composed of carbon anode and LiCoO₂ cathode have acceptable cycleability and a good rate capability.
- IT 9011-17-0, Kynar 2801
 RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (binder for electrode composites; preparation of porous, chemical cross-linked, PVdF-based gel polymer electrolytes for

rechargeable lithium batteries)

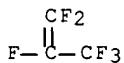
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene
(CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)

RL: DEV (Device component use); USES (Uses)

(cathode composite with Kynar and acetylene

black; preparation of porous, chemical cross-linked, PVdF-based gel
polymer electrolytes for rechargeable lithium batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 35, 38, 76

IT Carbon black, uses

RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)

(cathode composite with Kynar and LiCoO₂;

preparation of porous, chemical cross-linked, PVdF-based gel polymer
electrolytes for rechargeable lithium batteries)

IT 7440-44-0, Super P, uses

RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)

(activated (Super P), and MCMB 1028, anode composites

with Kynar; preparation of porous, chemical cross-linked, PVdF-based gel
polymer electrolytes for rechargeable lithium batteries)

IT 9011-17-0, Kynar 2801

RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or
reagent); USES (Uses)

(binder for electrode **composites**; preparation of porous, chemical cross-linked, PVdF-based gel polymer electrolytes for rechargeable lithium batteries)

- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); USES (Uses)
 (cathode **composite** with Kynar and acetylene
 black; preparation of porous, chemical cross-linked, PVdF-based gel polymer electrolytes for rechargeable lithium batteries)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 RL: DEV (Device component use); USES (Uses)
 (gel **composites** with carbonates/lithium salts/; preparation of porous, chemical cross-linked, PVdF-based gel polymer electrolytes for rechargeable lithium batteries)

REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 2 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:610813 HCPLUS Full-text

DOCUMENT NUMBER: 139:152337

TITLE: Method for manufacture of electrochemical cell including a separation membrane with porous polymer membrane and a separation membrane support

INVENTOR(S): Hong, Jin-Young; Kang, Hyo-Rang

PATENT ASSIGNEE(S): Newturn Energy Co., Ltd., S. Korea

SOURCE: PCT Int. Appl., 41 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
WO 2003065481	A1	20030807	WO 2002-KR310	200202 26
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
KR 2003065074	A	20030806	KR 2002-5226	200201 29
TW 540174	B	20030701	TW 2002-91104502	200203 11
PRIORITY APPLN. INFO.:			KR 2002-5226	A
				200201 29

AB Disclosed are an electrochem. cell having excellent characteristics of impregnation with electrolytic solution and a method for manufacturing the same. The cell includes an anode, a **cathode** and polymer separation membrane installed between an anode and a **cathode** through polymer binder membrane. The polymer separation membrane is manufactured by forming polymer membrane including polyvinylidene-based polymer onto the supporting body of separation membrane. After extracting process of **plasticizer**, compressing process is implemented, so that **plasticizer** can be eliminated completely. Also, the polymer membrane is thin, so that non-uniformity of the manufacturing process is minimized. The polymer binder having a good adhesiveness is used, so that the attachment between electrode and separation membrane is practicable even at a low temperature Addnl., since binding is a spot binding, a cell having good characteristics of impregnation with an electrolytic solution and a good performance is provided.

IT 12190-79-3, Cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

RN 12190-79-3 HCPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: TEM (Technical or engineered material use); USES (Uses)

(support; method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

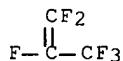
RN 9011-17-0 HCPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M002-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 39, 72

IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (mesocarbon microbeads; method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 12190-79-3, Cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate 324745-49-5, TF 4035
 RL: DEV (Device component use); USES (Uses)
 (method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

IT 84-74-2, Dibutylphthalate 627-93-0, Dimethyl adipate
 RL: MOA (Modifier or additive use); USES (Uses)
 (plasticizer; method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 25038-59-9, Mylar, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (support; method for manufacture of electrochem. cell including separation membrane with porous polymer membrane and separation membrane support)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L49 ANSWER 3 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:811781 HCPLUS Full-text
 DOCUMENT NUMBER: 137:327379
 TITLE: Continuous production of trilaminates by coextrusion for polymer lithium batteries
 INVENTOR(S): Naarmann, Herbert; Kruger, Franz Josef;
 Schaefer, Tim
 PATENT ASSIGNEE(S): Dilo Trading A.-G., Switz.
 SOURCE: Ger. Offen., 10 pp.
 CODEN: GWXXBX
 DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10118639	A1	20021024	DE 2001-10118639	200104 12
DE 10118639	B4	20070614	DE 2001-10118639	200104 12
PRIORITY APPLN. INFO.:				

AB The invention concerns the production of Trilamainates, consisting of an anode composite, polymer electrolytes and a cathode composite, which are provided on the cathode side and on the anode side with a metallic grid. The production is carried out continuously, preferably via coextrusion. The systems thus obtained form the basis for rechargeable polymer lithium batteries. The procedure according to invention contains the production of anode masses,

cathode material as well as the polymer gel electrolyte, which are: (1) homogeneously developed, (2) agree in structural viscosity and rheol., and (3) defined in shape by extrusion; and can be continuously formed as bands with reproducible wts. and laminated. The anode mass consists of graphite, preferably synthetic, e.g., mesocarbon microbeads with spherical particles or graphite fibers as well as a polymer binder e.g. polyfluoroelastomeres, polyolefins, polybutadiene or styrene copolymers, as well as polymethacrylates with alc. residues C4-C20, and polyvinyl compds. such as polyvinylpyrrolidone, polyvinylimidazole, polyvinylpyridin etc. and their copolymers, e.g. with methacrylic acid ester with alc. residues C4-C20, and a conducting salt e.g., LiPF₆ or Li oxalato borates, etc.

IT 12190-79-3, Cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(continuous production of trilaminates by coextrusion for polymer lithium batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Kynar 2801

RL: MOA (Modifier or additive use); USES (Uses)

(continuous production of trilaminates by coextrusion for polymer lithium batteries)

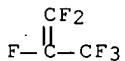
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M010-38

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT Battery anodes
 Battery **cathodes**
 Extrusion of plastics and rubbers
 Laminated materials
 (continuous production of trilaminates by coextrusion for polymer lithium batteries)
 IT **Carbon** fibers, uses
 RL: DEV (Device component use); USES (Uses)
 (graphite; continuous production of trilaminates by coextrusion for polymer lithium batteries)
 IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate
 9003-17-2, Polybutadiene 9003-39-8, Polyvinylpyrrolidone
 9003-47-8, Polyvinylpyridine 9003-53-6, Polystyrene 12031-65-1,
 Lithium nickel oxide linio₂ 12057-17-9, Lithium manganese oxide
 limn₂o₄ 12190-79-3, Cobalt lithium oxide colio₂
 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium
 hexafluorophosphate 25087-26-7D, Polymethacrylic acid, alkyl
 esters, with C4-20 alcs. 25232-42-2, Polyvinylimidazole
 33454-82-9, Lithium triflate 37296-91-6, Lithium molybdenum oxide
 37349-20-5, Lithium tungsten oxide 39302-37-9, Lithium titanium
 oxide 473540-08-8
 RL: DEV (Device component use); USES (Uses)
 (continuous production of trilaminates by coextrusion for polymer lithium batteries)
 IT 7631-86-9, Silica, uses 9011-17-0, Kynar 2801
 RL: MOA (Modifier or additive use); USES (Uses)
 (continuous production of trilaminates by coextrusion for polymer lithium batteries)
 IT 7440-44-0, **Carbon**, uses
 RL: DEV (Device component use); USES (Uses)
 (mesocarbon microbeads; continuous production of trilaminates by coextrusion for polymer lithium batteries)

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L49 ANSWER 4 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:793988 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:297441
 TITLE: Fabrication of secondary batteries comprising
 polymer binders
 INVENTOR(S): Coulon, Michel; Silvert, Pierre-Yves;
 Irissin-Mangata, Josiane; Ameduri, Bruno
 PATENT ASSIGNEE(S): Le Carbone Lorraine, Fr.
 SOURCE: PCT Int. Appl., 23 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2002082571	A1	20021017	WO 2001-EP4291	200104 03

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
 CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE,

GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
 LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO,
 NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
 TZ, UA, UG, US, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD,
 TG

AU 2001250424 A1 20021021 AU 2001-250424

200104
03

WO 2002101865 A2 20021219 WO 2002-EP5209

200203
28

WO 2002101865 A3 20040408

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
 CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD,
 GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,
 LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
 NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,
 TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
 BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI,
 FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG,
 CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2002325211 A1 20021223 AU 2002-325211

200203
28

PRIORITY APPLN. INFO.:

WO 2001-EP4291

W
200104
03

WO 2002-EP5209

W
200203
28

AB The present invention is a polymer alkaline ion electrochem. cell with improved thermal and chemical stability and a method for making the same. The cell of the invention comprises a pos. collector, a neg. collector, a **pos. electrode**, a neg. electrode, a separator and an electrolyte, the separator comprising a binder and filler, each of the electrodes comprising a binder, and is characterized in that at least one of the binders is a VDF/HFP copolymer which has been made insol. in the electrolyte by a heat treatment. In a preferred embodiment, the copolymer is made insol. by crosslinking.

IT 12190-79-3, Cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(fabrication of secondary batteries comprising polymer binders)

RN 12190-79-3 HCPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: MOA (Modifier or additive use); USES (Uses)

(fabrication of secondary batteries comprising polymer binders)

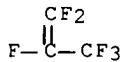
RN 9011-17-0 HCPLUS

CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene
(CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M004-62

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72

IT Carbon black, uses

RL: DEV (Device component use); USES (Uses)

(fabrication of secondary batteries comprising polymer binders)

IT 96-48-0, γ -Butyrolactone 616-38-6, Dimethyl carbonate
7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide
colio2 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(fabrication of secondary batteries comprising polymer binders)

IT 1309-48-4, Magnesia, uses 9011-14-7, Pmma 9011-17-0,

Hexafluoropropylene-vinylidene fluoride copolymer

RL: MOA (Modifier or additive use); USES (Uses)

(fabrication of secondary batteries comprising polymer binders)

IT 84-74-2, Dibutyl phthalate 108-32-7, Propylene carbonate

RL: MOA (Modifier or additive use); USES (Uses)

(plasticizer; fabrication of secondary batteries

comprising polymer binders)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L49 ANSWER 5 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:591812 HCPLUS Full-text

DOCUMENT NUMBER: 137:127621

TITLE: Process for fabrication electrode foils for
batteriesINVENTOR(S): Haug, Peter; Birke, Peter; Holl, Konrad; Ilic,
Dejan

PATENT ASSIGNEE(S): Microbatterie Gmbh, Germany; Varta Microbattery

GmbH
 SOURCE: Eur. Pat. Appl., 8 pp.
 DOCUMENT TYPE: Patent
 LANGUAGE: German
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1229597	A2	20020807	EP 2001-127808	200111 22
EP 1229597	A3	20040428	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR	
DE 10104988	A1	20020808	DE 2001-10104988	200102 03
JP 2002289197	A	20021004	JP 2002-24157	200201 31
US 2002119371	A1	20020829	US 2002-61643	200202 01
CN 1369923	A	20020918	CN 2002-103349	200202 01
PRIORITY APPLN. INFO.:			DE 2001-10104988	A 200102 03

AB In a wet chemical process for batteries, which contain ≥1 Li intercalating electrode, which contains a mixture of ≥2 fluorinated polymers, in which polymer matrix is finely dispersed in polymer-insol. electrochem. active material; ≥2 fluoropolymers are dissolved in a solvent and without addition of plasticizer, swelling agent, or electrolyte, but with a highly conducting soot, whose BET surface area lies between that of surface minimized graphite and activated C. The electrochem. active material has a 2-dimensional layer structure and an electronic conductivity of ≤10⁻⁴ S/cm, in which Li reversibly intercalates and deintercalates. The pasty mass thus obtained is applied on an electrode grid or a support film and dried. The anode and cathode films so obtained are laminated to a separator, the stack is soaked with liquid organic electrolyte to form a battery.

IT 12190-79-3, Cobalt lithium oxide colio2
 RL: DEV (Device component use); USES (Uses)
 (process for fabrication electrode foils for batteries)

RN 12190-79-3 HCPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

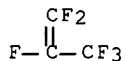
Component	Ratio	Component
		Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: MOA (Modifier or additive use); USES (Uses)
 (process for fabrication electrode foils for batteries)
 RN 9011-17-0 HCAPLUS
 CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4
 CMF C3 F6



CM 2

CRN 75-38-7
 CMF C2 H2 F2



IC ICM H01M004-04
 ICS H01M004-62; H01M004-02; H01M004-52
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT Battery anodes
 Battery **cathodes**
 Soot
 (process for fabrication electrode foils for batteries)
 IT Graphitized **carbon** black
 RL: DEV (Device component use); USES (Uses)
 (process for fabrication electrode foils for batteries)
 IT 12190-79-3, Cobalt lithium oxide colio2
 RL: DEV (Device component use); USES (Uses)
 (process for fabrication electrode foils for batteries)
 IT 872-50-4, n-Methyl-2-pyrrolidone, uses 9011-17-0,
 Hexafluoropropylene-vinylidene fluoride copolymer
 RL: MOA (Modifier or additive use); USES (Uses)
 (process for fabrication electrode foils for batteries)

L49 ANSWER 6 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:585692 HCAPLUS Full-text
 DOCUMENT NUMBER: 137:111643
 TITLE: Method for manufacture of gel polymer
 electrolyte separator for laminated lithium ion
 batteries
 INVENTOR(S): Lin, Yunqing; Ge, Shao; Sun, Shuhua
 PATENT ASSIGNEE(S): Jida Chaoyue S & T Development Co., Ltd., Peop.
 Rep. China
 SOURCE: Faming Zhanli Shengqing Gongkai Shuomingshu, 12
 pp.
 CODEN: CNXXEV
 DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1310483	A	20010829	CN 2001-108824	200102 20
PRIORITY APPLN. INFO.:			CN 2001-108824	A 200102 20
			CN 2001-106067	200101 09

AB The separator, 25-80 Φ mm thick, is manufactured by dissolving hexafluoropropylene-vinylidene fluoride copolymer and **plasticizer** such as DBP in an organic solvent at 50° C, adding inorg. filler (nanometer SiO₂, pretreated with dispersing agent) in forms of slurry of acetone or butanone to the polymer solution, cooling to 30.degree.C, and forming a film by coating. The **pos. electrode** film is manufactured by preparing a slurry containing LiCoO₂ (or LiNiO₂, LiMn₂O₄), acetylene black, hexafluoropropylene-vinylidene fluoride copolymer, DBP, and a dispersing agent, coating the slurry on a glass strip or a metal foil, and drying at 30- 60.degree.C. The neg. electrode film is manufactured by preparing a slurry containing carbonaceous material (MCMB) powder, acetylene black, hexafluoropropylene-vinylidene fluoride copolymer, DBP, and a dispersing agent (e.g., OP-10), coating the slurry on a glass strip or a metal foil, and drying at 30-60.degree.C. The laminated battery is manufactured by laminating an Al network (pos. current collector), the **pos. electrode** film, the separator, the neg. electrode film, and a Cu network by hot pressing at 130-135.degree.C to form a battery unit, making a stack of the battery units, hot pressing, removing DBP with a petroleum ether having a b.p. 90- 120.degree.C or methanol, drying, and introducing an liquid electrolyte into the battery stack.

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
12190-79-3, Cobalt lithium oxide (LiCoO₂)
RL: CPS (Chemical process); DEV (Device component use); PEP
(Physical, engineering or chemical process); PROC (Process); USES
(Uses)

(gel polymer electrolyte separator and electrode films for
laminated lithium ion batteries)

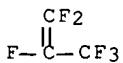
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene
(CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7
CMF C2 H2 F2

RN 12190-79-3 HCPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M002-14

ICS H01M002-16; H01M010-38

CC 52-2 (Electrochemical, Radiation, and Thermal Energy Technology)
Section cross-reference(s): 38

IT Battery anodes

Battery **cathodes**

Films

Secondary battery separators

(gel polymer electrolyte separator and electrode films for
laminated lithium ion batteries)

IT Carbon black, uses

Carbonaceous materials (technological products)

RL: CPS (Chemical process); DEV (Device component use); PEP
(Physical, engineering or chemical process); PROC (Process); USES
(Uses)(gel polymer electrolyte separator and electrode films for
laminated lithium ion batteries)IT 7631-86-9, Silica, uses 9011-17-0, Hexafluoropropylene-
vinylidene fluoride copolymer 12031-65-1, Lithium nickel oxide
(LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄)12190-79-3, Cobalt lithium oxide (LiCoO₂)RL: CPS (Chemical process); DEV (Device component use); PEP
(Physical, engineering or chemical process); PROC (Process); USES
(Uses)(gel polymer electrolyte separator and electrode films for
laminated lithium ion batteries)

L49 ANSWER 7 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:731230 HCPLUS Full-text

DOCUMENT NUMBER: 135:275380

TITLE: Method of making bonded-electrode rechargeable
batteries and supercapacitors

INVENTOR(S): Gozdz, Antoni S.; Tarascon, Jean-Marie

PATENT ASSIGNEE(S): Valence Technology, Inc., USA

SOURCE: PCT Int. Appl., 29 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001073871	A2	20011004	WO 2001-US9491	200103 23
WO 2001073871	A3	20020627		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CE, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6391069	B1	20020521	US 2000-538575	200003 29
CA 2405017	A1	20011004	CA 2001-2405017	200103 23
EP 1269560	A2	20030102	EP 2001-920726	200103 23
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003530663	T	20031014	JP 2001-571493	200103 23
TW 496007	B	20020721	TW 2001-90107388	200105 02
US 2002110728	A1	20020815	US 2002-115697	200204 03
IN 2002CN01532	A	20050128	IN 2002-CN1532	200209 24
PRIORITY APPLN. INFO.:				
		US 2000-538575	A	200003 29
		US 2000-538574	A1	200003 29
		WO 2001-US9491	W	200103 23

AB A Li-ion battery cell comprising a polymeric matrix pos. electrode layer member, a polymeric matrix neg. electrode layer member, and an interposed microporous polyolefin separator layer member is laminated into a unitary, flexible cell structure by means of heat and pressure without necessity for applied interlayer adhesive. A primary plasticizer for the electrode member matrix polymer is included in the electrode layer compns. During the

lamination operation, which may be carried out at a moderate-temperature that does not compromise the thermal shutdown capability of the microporous separator, the **plasticizer** softens the polymer into a thermoplastic adhesive which forms an effective bond to the untreated polyolefin surface in the region of the electrode/separator interface. The **plasticizer** dissipates from the **composition** along with residual lamination heat or may be extracted with solvent or supercrit. fluid, thereby enabling the electrode polymer alone to form a strong, permanent bond to the polyolefin separator member.

IT 12190-79-3, cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(method of making bonded-electrode rechargeable batteries and supercapacitors)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: TEM (Technical or engineered material use); USES (Uses)

(method of making bonded-electrode rechargeable batteries and supercapacitors)

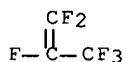
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M004-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76

IT Polyoxyalkylenes, uses

RL: MOA (Modifier or additive use); USES (Uses)

(ethers, **plasticizer**; method of making bonded-electrode rechargeable batteries and supercapacitors)

- IT Battery anodes
 Battery **cathodes**
 Evaporation
Plasticizers
 (method of making bonded-electrode rechargeable batteries and supercapacitors)
- IT 12190-79-3, cobalt lithium oxide colio2
 RL: DEV (Device component use); USES (Uses)
 (method of making bonded-electrode rechargeable batteries and supercapacitors)
- IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (method of making bonded-electrode rechargeable batteries and supercapacitors)
- IT 9002-85-1, Polyvinylidene chloride 9002-86-2, Pvc 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile 25322-68-3, Peo
 RL: TEM (Technical or engineered material use); USES (Uses)
 (method of making bonded-electrode rechargeable batteries and supercapacitors)
- IT 21324-40-3, Lithium hexafluorophosphate
 RL: DEV (Device component use); USES (Uses)
 (**plasticizer**; method of making bonded-electrode rechargeable batteries and supercapacitors)
- IT 88-99-3D, Phthalic acid, dialkyl derivative 108-32-7, Propylene carbonate 110-15-6D, Succinic acid, dialkyl derivative 111-20-6D, Sebacic acid, dialkyl derivative 124-04-9, Adipic acid, uses 463-79-6D, Carbonic acid, alkylene derivative, uses 7664-38-2D, Phosphoric acid, trialkyl derivative, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**plasticizer**; method of making bonded-electrode rechargeable batteries and supercapacitors)

L49 ANSWER 8 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2001:731225 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:259894
 TITLE: Flat, bonded-electrode rechargeable electrochemical cell devices such as rechargeable batteries and supercapacitors
 INVENTOR(S): Gozdz, Antoni S.
 PATENT ASSIGNEE(S): Valence Technology, Inc., USA; Valence Technology Nevada, Inc.
 SOURCE: PCT Int. Appl., 30 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001073863	A2	20011004	WO 2001-US9004	
				200103
				21
WO 2001073863	A3	20020906		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,				

LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO,
 NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
 TZ, UA, UG, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD,
 TG

CA 2404507	A1	20011004	CA 2001-2404507	
				200103
				21
AU 200147638	A	20011008	AU 2001-47638	
				200103
				21
EP 1269559	A2	20030102	EP 2001-920604	
				200103
				21
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003530662	T	20031014	JP 2001-571485	
				200103
				21
TW 531918	B	20030511	TW 2001-90107400	
				200105
				02
US 2002110728	A1	20020815	US 2002-115697	
				200204
				03
IN 2002CN01531	A	20050128	IN 2002-CN1531	
				200209
				24
PRIORITY APPLN. INFO.:			US 2000-538574	A
				200003
				29
		US 2000-538575	A1	
				200003
				29
		WO 2001-US9004	W	
				200103
				21

AB A Li-ion battery cell comprising a polymeric matrix pos. electrode layer member, a polymeric matrix neg. electrode layer member, and an interposed microporous polyolefin separator layer member is laminated into a unitary, flexible cell structure by means of heat and pressure without necessity of applied interlayer adhesive. A volatile vehicle solution of a primary plasticizer for the electrode member polymer matrix is applied to the microporous separator member where it is absorbed into the porous structure. Evaporation of the volatile vehicle solvent deposits the plasticizer upon and within the pores of the separator member. During the lamination operation the plasticizer is forced into contact with the electrode member polymer where it softens the polymer into a thermoplastic adhesive in the region of the electrode/separator interface, thereby enabling the electrode polymer alone to form a strong bond to the separator upon cooling.

IT 12190-79-3, cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)
 (flat bonded-electrode rechargeable electrochem. cell devices
 such as rechargeable batteries and supercapacitors)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene=vinylidene fluoride copolymer
 RL: TEM (Technical or engineered material use); USES (Uses)
 (flat bonded-electrode rechargeable electrochem. cell devices
 such as rechargeable batteries and supercapacitors)

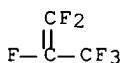
RN 9011-17-0 HCPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 76

IT Battery anodes

Battery **cathodes**

Battery electrodes

Capacitor electrodes

Plasticizers

Secondary battery separators

Solvent extraction

(flat bonded-electrode rechargeable electrochem. cell devices
 such as rechargeable batteries and supercapacitors)

IT 7429-90-5, Aluminum, uses 7782-42-5, Graphite, uses 9003-07-0
 12190-79-3, cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(flat bonded-electrode rechargeable electrochem. cell devices
 such as rechargeable batteries and supercapacitors)

IT 7440-44-0, Carbon, uses

RL: MOA (Modifier or additive use); USES (Uses)

(flat bonded-electrode rechargeable electrochem. cell devices

such as rechargeable batteries and supercapacitors)
 IT 67-64-1, Acetone, uses 108-32-7, Propylene carbonate 9002-85-1,
 Polyvinylidene chloride 9002-86-2, Polyvinyl chloride 9011-14-7,
 Pmma 9011-17-0, Hexafluoropropylene=vinylidene fluoride
 copolymer 24937-79-9, Pvdf 25014-41-9, Polyacrylonitrile
 25322-68-3, Peo
 RL: TEM (Technical or engineered material use); USES (Uses)
 (flat bonded-electrode rechargeable electrochem. cell devices
 such as rechargeable batteries and supercapacitors)

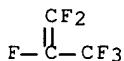
L49 ANSWER 9 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2001:635714 HCAPLUS Full-text
 DOCUMENT NUMBER: 135:183329
 TITLE: Manufacture of secondary nonaqueous electrolyte
 batteries
 INVENTOR(S): Kano, Koji; Iwahisa, Masahiro; Hibino, Seiji
 PATENT ASSIGNEE(S): Toshiba Battery Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001236991	A	20010831	JP 2000-43081	
				200002
				21
PRIORITY APPLN. INFO.:			JP 2000-43081	
				200002
				21

AB The batteries are manufactured by using **cathode** and/or anode active slurries prepared by stirring a **mixture** containing an electrode active mass, a nonaq. electrolyte retaining binder, a **plasticizer**, and a solvent at a temperature $\geq 40^\circ$ and below the bubble generating temperature of the **mixture**. The battery separators may also be manufactured by using a slurry containing an electrolyte retaining binder, a **plasticizer**, and a solvent prepared in a similar manner.
 IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (temperature control in preparation of electrode active mass slurries and separator slurries for secondary lithium batteries)
 RN 9011-17-0 HCAPLUS
 CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4
 CMF C3 F6



CM 2

CRN 75-38-7
CMF C2 H2 F2

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (temperature control in preparation of electrode active mass slurries for secondary lithium batteries)
 RN 12190-79-3 HCPLUS
 CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-40
 ICS H01M004-02; H01M004-04
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT Carbon fibers, uses
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (temperature control in preparation of electrode active mass slurries for secondary lithium batteries)
 IT 84-74-2, Dbp 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (temperature control in preparation of electrode active mass slurries and separator slurries for secondary lithium batteries)
 IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (temperature control in preparation of electrode active mass slurries for secondary lithium batteries)

L49 ANSWER 10 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2001:338909 HCPLUS Full-text
 DOCUMENT NUMBER: 134:355442
 TITLE: Films for electrochemical components and method
 for producing the same
 INVENTOR(S): Birke, Peter; Salam, Fatima
 PATENT ASSIGNEE(S): Fraunhofer-Gesellschaft zur Foerderung de
 Angewandten Forschung e.V., Germany
 SOURCE: PCT Int. Appl., 40 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001033656	A1	20010510	WO 2000-EP10259	200010 18
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
DE 19952335	A1	20010517	DE 1999-19952335	199910 29
DE 19952335	B4	20070329		
CA 2389153	A1	20010510	CA 2000-2389153	200010 18
BR 2000015072	A	20020618	BR 2000-15072	200010 18
EP 1230708	A1	20020814	EP 2000-975881	200010 18
EP 1230708	B1	20071017		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
JP 2003513429	T	20030408	JP 2001-535249	200010 18
IN 2002KN00504	A	20060210	IN 2002-KN504	200204 22
PRIORITY APPLN. INFO.:			DE 1999-19952335	A 199910 29
			WO 2000-EP10259	W 200010 18

OTHER SOURCE(S): MARPAT 134:355442

AB The invention relates to a paste-like **compns.** for use in electrochem. components. Said paste comprises a heterogeneous **mixture** from (1) a matrix (A) that comprises at least one organic polymer, the precursors thereof or the prepolymers thereof and a **plasticizer** or that consists of theses components and (2) an inorg. material in the form of a solid substance (B) that can be electrochem. activated and that is not soluble in the matrix and in water, with the proviso that the **mixture** does not contain a conductor that is soluble in the **plasticizer** and that is different from (B). The invention also relates to layers (films) and electrochem. interlaminar structures (for example electrochem. cells). The **plasticizer** used is preferably at least one substance that carries A1DA2, wherein A1 and A2 may independently represent

R1, OR1, SR1 or NHR1, with R1 equal C1-C6 alkyl, or A1 and A2 together with D form a 5-membered heterocyclic ring and D may represent C:O, S:O, C:NH or C:CH₂ and may also represent O, S, NH or CH₂ if D together with A1 and A2 forms a 5-membered heterocyclic ring. The presence of the **plasticizer** provides thinner films with higher flexibility. A typical paste for a neg. film electrode contained Li₄Ti₅O₁₂ 5, acetylene black 1, ethylene carbonate 0.5, hexafluoropropylene-vinylidene fluoride copolymer 1.25, and Me₂CO 50 g.

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)

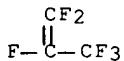
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IT 12190-79-3, Lithium cobalt oxide (LiCoO₂)

RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-40

ICS H01M004-62; H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery film anode **plasticized** polymer; lithium titanate acetylene black film **cathode** battery; ethylene carbonate **plasticizer** fluoropolymer battery film **cathode**

- IT Carbon black, uses
 Metals, uses
 Nitrides
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (elec. conductivity enhancer; films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT Battery anodes
 Battery **cathodes**
Plasticizers
 Secondary batteries
 Semiconductor materials
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT Polymers, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT Iodides, uses
 Nitrides
 Oxides (inorganic), uses
 Sulfides, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT Metals, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (lithium alloyable; films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT 7782-42-5, Graphite, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (elec. conductivity enhancer; films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 RL: DEV (Device component use); MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT 1302-37-0, Spodumene 12031-95-7, Lithium titanate (Li₄Ti₅O₁₂)
 12190-79-3, Lithium cobalt oxide (LiCoO₂)
 RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT 1302-66-5, Petalite 12036-22-5, Tungsten dioxide 12039-13-3,
 Titanium disulfide 13463-67-7, Titanium oxide, uses 18868-43-4,
 Molybdenum dioxide 19497-94-0, β -Eucryptite 39300-70-4,
 Lithium nickel oxide 68136-21-0, Manganese nickel oxide
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (films with good flexibility and low thickness containing polymer binders and **plasticizers** for battery components)
- IT 67-68-5, Dimethyl sulfoxide, uses 96-48-0, γ -Butyrolactone

96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
 108-32-7, Propylene carbonate 109-99-9, THF, uses 616-38-6,
 Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0,
 Dioxolane 3741-38-6, Ethylene sulfite 56525-42-9, Methyl propyl
 carbonate

RL: DEV (Device component use); MOA (Modifier or additive use); TEM
 (Technical or engineered material use); USES (Uses)
 (plasticizer; films with good flexibility and low
 thickness containing polymer binders and plasticizers for
 battery components)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L49 ANSWER 11 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:210247 HCAPLUS Full-text

DOCUMENT NUMBER: 134:225103

TITLE: Secondary lithium batteries and their
 manufacture

INVENTOR(S): Park, Chi Gyun; Kakirde, Archana; Riu, Pey Kan;
 Manivannan, Venkatesan; Chyai, Chul; Im, Dong
 Joon; Lee, Jae Ha

PATENT ASSIGNEE(S): SKC Co., Ltd., S. Korea

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001076758	A	20010323	JP 2000-238413	200008 07
KR 2001016919	A	20010305	KR 1999-32141	199908 05
PRIORITY APPLN. INFO.:			KR 1999-32141	A 199908 05

AB The batteries have a polymer electrolyte between a **cathode** and an anode, where the electrolyte and/or the active mass for the **cathode** and/or for the anode contain poly(vinylidene fluoride), hexafluoropropylene-vinylidene fluoride copolymer containing 0-8% hexafluoropropylene, a **mixture** of the 2 polymers, or a **mixture** of the copolymer and a hexafluoropropylene-vinylidene fluoride copolymer containing 0-15% vinylidene fluoride. The batteries are prepared by applying an anode active mass on an anode collector, applying a polymer electrolyte to both side of the anode, applying a **cathode** active mass on a **cathode** collector, attaching the **cathode** to the electrolyte coated anode, removing **plasticizer** from the electrode-electrolyte stack, and injecting an electrolyte solution; where the electrode active mass and the polymer electrolyte contain a solvent selected from N-Me pyrrolidone, DMF, and ketones.

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)

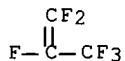
(fluoropolymer binders in manufacture of secondary polymer electrolyte lithium batteries)

RN 9011-17-0 HCPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
(CA INDEX NAME)

CM 1

CRN 116-15-4
CMF C3 F6



CM 2

CRN 75-38-7
CMF C2 H2 F2



RN 12190-79-3 HCPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-40

ICS H01M004-02; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7440-44-0, Carbon, uses 9011-17-0,

Hexafluoropropylene-vinylidene fluoride copolymer 12190-79-3
, Cobalt lithium oxide (CoLiO₂) 24937-79-9, Poly(vinylidene
fluoride)

RL: DEV (Device component use); PEP (Physical, engineering or
chemical process); PROC (Process); USES (Uses)

(fluoropolymer binders in manufacture of secondary polymer electrolyte
lithium batteries)

L49 ANSWER 12 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:179635 HCPLUS Full-text

DOCUMENT NUMBER: 134:210518

TITLE: Process for large scale fabrication of lithium
polymer batteries with solid electrolytes in the
film technology

INVENTOR(S): Meislitzer, Karl Heinz

PATENT ASSIGNEE(S): Bangert, Wolfgang, Germany; Sebastian, Rudolf

SOURCE: Ger. Offen., 12 pp.

CODEN: GWXXBX

DOCUMENT TYPE:

Patent

LANGUAGE:

German

FAMILY ACC. NUM. COUNT:

1

PATENT INFORMATION:

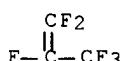
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19941861	A1	20010315	DE 1999-19941861	
				199909
				02
PRIORITY APPLN. INFO.:			DE 1999-19941861	
				199909
				02

- AB Films for **cathodes** and anodes as well as for the electrolytes are pulled from pastes of suitable **composition** and preparation. **Cathode** pastes are prepared from: 3-10% polymer or copolymer, PEO, polystyrene, polyvinyl chloride, polyvinylidene fluoride, or polyvinylidene fluoride-hexafluoropropylene copolymer (PVDF-HFP); 4-12% **plasticizer** (e.g., dibutylphthalate or dioctyl phthalate); 20-60 g% intercalation material (e.g., LiCoO₂, LiNiO₂, LiCoxNil-xO₂, LiMn₂O₄ or VO_x); 2-10% elec. conductor (e.g., graphite powder or amorphous C); and 40-80% solvent (e.g., acetone). Anode paste comprises: 3-10% polymer or copolymer (e.g., PEO, polystyrene, PVC, PVDF, or PVDF-HFP copolymer), 4-12% **plasticizer** (di-Bu phthalate or dioctyl phthalate), 20-40% elec. conductor (graphite powder or amorphous C), and 40-80% solvent (acetone). The electrolyte paste comprises: 3-10 g% polymer or copolymer (PEO, polystyrene, PVC, PVDF or hexafluoropropylene-vinylidene fluoride copolymer), 4-12% **plasticizer** (DBP or DOP), 20-40% ionic conductor (Li₉Al₂SiO₈, Li_{1.3}Al_{0.3}Ti_{1.7}(PO₄)₃, LiTi₂(PO₄)₃, Li₂O or Li₄SiO₄.Li₃PO₄), 2-10% ionic conductor (LiClO₄, LiBF₄, LiCl, LiBr, or LiI) and 40-80 g% solvent (acetone).
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 12190-79-3, Cobalt lithium oxide colio2
 RL: DEV (Device component use); USES (Uses)
 (process for large scale fabrication of lithium polymer batteries
 with solid electrolytes in film technol.)
- RN 9011-17-0 HCAPLUS
- CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



RN 12190-79-3 HCPLUS
 CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M004-04
 ICS H01M004-62; H01M004-48
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 IT Battery anodes
 Battery **cathodes**
 Films
 (process for large scale fabrication of lithium polymer batteries
 with solid electrolytes in film technol.)
 IT 7440-44-0, Carbon, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (amorphous; process for large scale fabrication of lithium
 polymer batteries with solid electrolytes in film technol.)
 IT 84-74-2, Dibutyl phthalate 117-84-0, Dioctyl phthalate
 RL: DEV (Device component use); USES (Uses)
 (plasticizer; process for large scale fabrication of
 lithium polymer batteries with solid electrolytes in film
 technol.)
 IT 9002-86-2, Polyvinyl chloride 9003-53-6, Polystyrene
 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 11099-11-9, Vanadium oxide 12031-65-1, Lithium nickel oxide linio2
 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3,
 Cobalt lithium oxide colio2 24937-79-9, Polyvinylidene fluoride
 25322-68-3, Peo 131344-56-4, Cobalt lithium nickel oxide
 RL: DEV (Device component use); USES (Uses)
 (process for large scale fabrication of lithium polymer batteries
 with solid electrolytes in film technol.)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L49 ANSWER 13 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2000:441552 HCPLUS Full-text
 DOCUMENT NUMBER: 133:46201
 TITLE: Method of fabrication of solid state polymer
 batteries
 INVENTOR(S): Muraoka, Hiroki; Kinoshita, Kazushige; Ohata,
 Tsumoru; Shimizu, Kyoushige
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
 SOURCE: Eur. Pat. Appl., 14 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1014466	A1	20000628	EP 1999-103670	199902 25
EP 1014466	B1	20031008	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO	
JP 2000195501	A	20000714	JP 1998-368907	199812 25
CA 2263080	C	20040810	CA 1999-2263080	199902 26
KR 2000047375	A	20000725	KR 1999-8265	199903 12
CN 1258938	A	20000705	CN 1999-104534	199903 31
PRIORITY APPLN. INFO.:			JP 1998-368907	A 199812 25

AB A thin perforated collector is disposed in flushed state on the outer end surface of the **cathode** active material layer or the collector is embedded in the **cathode** active material layer so that the bottom plane facing the anode is present at the position of 2/3 to 4/5 of the total thickness of the layer from the side facing the anode. The collector of the **cathode** is prevented from peeling off from the **cathode** active material and besides the utilization ratio of the **cathode** active material is enhanced.

IT 12190-79-3, Cobalt lithium oxide colio2
RL: DEV (Device component use); USES (Uses)
(method of fabrication of solid state polymer batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
RL: TEM (Technical or engineered material use); USES (Uses)
(method of fabrication of solid state polymer batteries)

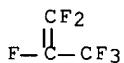
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3-hexafluoro-, polymer with 1,1-difluoroethene
(CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7
CMF C2 H2 F2

IC ICM H01M010-40
 ICS H01M004-02; H01M010-04
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 IT **Battery cathodes**
 (method of fabrication of solid state polymer batteries)
 IT **Carbon black**, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (method of fabrication of solid state polymer batteries)
 IT 7429-90-5, Aluminum, uses 7440-44-0, **Carbon**, uses
 7440-50-8, Copper, uses 12190-79-3, Cobalt lithium oxide
 colio2
 RL: DEV (Device component use); USES (Uses)
 (method of fabrication of solid state polymer batteries)
 IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 RL: TEM (Technical or engineered material use); USES (Uses)
 (method of fabrication of solid state polymer batteries)
 IT 84-74-2, Dibutyl phthalate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (**plasticizer**; method of fabrication of solid state
 polymer batteries)
 REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR
 THIS RECORD. ALL CITATIONS AVAILABLE IN
 THE RE FORMAT

L49 ANSWER 14 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2000:191396 HCPLUS Full-text
 DOCUMENT NUMBER: 132:224815
 TITLE: Manufacturing method for solid polymer alloy
 electrolyte in homogeneous state for
 composite electrode, lithium polymer
 battery and lithium ion polymer battery
 INVENTOR(S): Yun, Kyung Suk; Cho, Byung Won; Cho, Won Il;
 Paik, Chi Hum; Kim, Hyung Sun; Kim, Un Sek
 PATENT ASSIGNEE(S): Korea Institute of Science and Technology, S.
 Korea
 SOURCE: PCT Int. Appl., 54 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.

KIND DATE

APPLICATION NO.

DATE

WO 2000016421	A1	20000323	WO 1998-KR494	199812 31
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
KR 2000019372	A	20000406	KR 1998-37423	199809 10
AU 9916951	A	20000403	AU 1999-16951	199812 31
EP 1114481	A1	20010711	EP 1998-961686	199812 31
EP 1114481	B1	20070801		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY				
AT 368944	T	20070815	AT 1998-961686	199812 31
US 6355380	B1	20020312	US 1999-231442	199901 14
JP 2000090728	A	20000331	JP 1999-46527	199902 24
JP 3085532	B2	20000911	KR 1998-37423	A 199809 10
PRIORITY APPLN. INFO.:			WO 1998-KR494	W 199812 31

AB A homogeneous solid polymer alloy electrolyte comprises a total 100 weight% of **mixture** of (a) function-I polymers in an amount of 5-90 weight% comprising one of polyacrylonitrile-based (PAN-based) solid polymers and poly(Me methacrylate)-based (PMMA-based) solid polymers which have superior adhesion and ion conductivity, (b) function-II polymers in an amount of 5-80 weight% comprising one of poly(vinylidene fluoride)-based (PVdF-based) solid polymers and the PMMA-based solid polymers which have superior compatibility with an organic solvent electrolyte, (c) function-III polymers in an amount of 5-80 weight% comprising one of poly(vinyl chloride)-based (PVC-based) solid polymers and the PVdF-based solid polymers which have superior mech. strength. The solid polymer alloy electrolyte has superior ion conductivity, compatibility with an organic solvent and mech. strength, and a lithium polymer battery and a lithium polymer battery manufactured by making the **composite** anode and **cathode** using the solid polymer alloy electrolyte, and stacking the solid polymer alloy electrolyte and the **composite** anode (**cathode**) in several times, has excellent adhesion, mech. stability, low/high

temperature characteristics, high rate discharge, charge/discharge properties, and battery capacity and battery cycle life characteristics.

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: DEV (Device component use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)

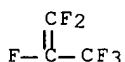
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IT 12190-79-3, Cobalt lithium oxide colio2

RL: MOA (Modifier or additive use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component	
			Registry Number
O	2		17778-80-2
Co	1		7440-48-4
Li	1		7439-93-2

IC ICM H01M006-18

ICS H01M006-22; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

IT Coke

RL: DEV (Device component use); USES (Uses)

(anode; manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)

IT Secondary batteries

(lithium; manufacturing method for solid polymer alloy electrolyte in

- homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT Battery cathodes
 Battery electrolytes
Plasticizers
 Polymer electrolytes
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT Fluoropolymers, uses
 RL: DEV (Device component use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT Carbon black, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (anode; manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT 1332-29-2, Tin oxide 7440-44-0, Carbon, uses
 7782-42-5, Graphite, uses 39448-96-9, Graphite lithium
 160479-36-7, Lithium tin oxide
 RL: DEV (Device component use); USES (Uses)
 (anode; manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT 105-37-3, Ethyl propionate 141-78-6, Acetic acid ethyl ester, uses
 1344-28-1, Alumina, uses 7439-93-2, Lithium, uses 7631-86-9,
 Silica, uses 9010-76-8, Acrylonitrile-vinylidene chloride
 copolymer 9010-88-2, Ethyl acrylate-methyl methacrylate copolymer
 9011-14-7, Pmma 9011-17-0, Hexafluoropropylene-vinylidene
 fluoride copolymer 21324-40-3, Lithium hexafluorophosphate
 24937-79-9, Polyvinylidene fluoride 24968-79-4,
 Acrylonitrile-methyl acrylate copolymer 25014-41-9,
 Polyacrylonitrile
 RL: DEV (Device component use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT 1314-62-1, Vanadium pentoxide, uses 12031-65-1, Lithium nickel
 oxide linio₂ 12037-42-2, Vanadium oxide v6o13 12057-17-9,
 Lithium manganese oxide limn₂o₄ 12190-79-3, Cobalt lithium
 oxide colio₂
 RL: MOA (Modifier or additive use); USES (Uses)
 (manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer battery)
- IT 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 96-49-1, Ethylene
 carbonate 108-32-7, Propylene carbonate 127-19-5, Dimethyl
 acetamide 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl
 carbonate
 RL: DEV (Device component use); USES (Uses)
 (**plasticizer**; manufacturing method for solid polymer alloy electrolyte in homogeneous state for **composite** electrode, lithium polymer battery and lithium ion polymer

battery)
IT 79-20-9, Methyl acetate 105-58-8 554-12-1, Methyl propionate
RL: DEV (Device component use); USES (Uses)
(solvent; manufacturing method for solid polymer alloy electrolyte in
homogeneous state for **composite** electrode, lithium
polymer battery and lithium ion polymer battery)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L49 ANSWER 15 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:182853 HCAPLUS Full-text
DOCUMENT NUMBER: 132:210247
TITLE: Polymer films and their manufacture for lithium
ion batteries
INVENTOR(S): Iyen, Hsiao Pin Elizabeth
PATENT ASSIGNEE(S): Nexcell Battery Co., Ltd., Taiwan; Electrochem
Automation Inc.
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000080176	A	20000321	JP 1999-256099	199908 07
TW 385564	B	20000321	TW 1998-87113266	199808 12
PRIORITY APPLN. INFO.:			TW 1998-87113266	A 199808 12

AB The films are manufactured by heating copolymers (e.g., PVDF copolymers) with
solvents, vigorously stirring the solns. with **mixts.** containing amyl acetate,
BuOH, and fillers, and forming films from the resulting viscous materials.
The films may be attached to **cathodes** or anodes, or used as separators in Li+
batteries. The polymer films are formed without using **plasticizers** and provide
batteries with good cycle stability.

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
RL: DEV (Device component use); USES (Uses)
(**cathode** material; manufacture of fluoropolymer films for
lithium ion batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

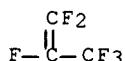
Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Kynar 2822
RL: DEV (Device component use); PEP (Physical, engineering or

chemical process); PROC (Process); USES (Uses)
 (manufacture of fluoropolymer films for lithium ion batteries)
 RN 9011-17-0 HCAPLUS
 CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene
 (CA INDEX NAME)

CM 1

CRN 116-15-4
 CMF C3 F6



CM 2

CRN 75-38-7
 CMF C2 H2 F2



IC ICM C08J005-18
 ICS H01M002-16; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 IT Carbon black, uses
 RL: DEV (Device component use); USES (Uses)
 (cathode or anode material; manufacture of fluoropolymer
 films for lithium ion batteries)
 IT Battery anodes
 Battery cathodes
 Plastic films
 Secondary battery separators
 (manufacture of fluoropolymer films for lithium ion batteries)
 IT 12190-79-3, Cobalt lithium oxide (CoLiO₂) 66554-04-9,
 Lithium magnesium oxide 187144-48-5, Cobalt lithium magnesium
 oxide
 RL: DEV (Device component use); USES (Uses)
 (cathode material; manufacture of fluoropolymer films for
 lithium ion batteries)
 IT 9011-17-0, Kynar 2822
 RL: DEV (Device component use); PEP (Physical, engineering or
 chemical process); PROC (Process); USES (Uses)
 (manufacture of fluoropolymer films for lithium ion batteries)

L49 ANSWER 16 OF 17 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1999:690285 HCAPLUS Full-text
 DOCUMENT NUMBER: 131:288891
 TITLE: Electrodes for secondary polymer electrolyte
 batteries and manufacture of the batteries
 INVENTOR(S): Kurisu, Shunji; Kimishima, Takahiro
 PATENT ASSIGNEE(S): Toshiba Battery Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

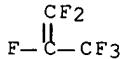
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11297312	A	19991029	JP 1998-95835	199804 08
PRIORITY APPLN. INFO.:			JP 1998-95835	199804 08

AB The electrodes have an electrolyte free paste layer, having a d. $\geq 90\%$ of the theor. d., on a collector. The batteries are prepared by applying an electrolyte free paste on collector, heating the pasted collector, and pressing to form **cathodes** and/or anodes. Preferably, the paste contains hexafluoropropylene-vinylidene fluoride copolymers and **plasticizers**.
 IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
 (controlled d. of active mass paste layers for electrodes in manufacture of secondary polymer batteries)
 RN 9011-17-0 HCPLUS
 CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



RN 12190-79-3 HCPLUS
 CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component | Ratio | Component

			Registry Number
O	2		17778-80-2
Co	1		7440-48-4
Li	1		7439-93-2

IC ICM H01M004-04

ICS H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Carbon black, uses

Carbon fibers, uses

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(controlled d. of active mass paste layers for electrodes in manufacture of secondary polymer batteries)

IT 84-74-2, Dbp 9011-17-0; Hexafluoropropylene-vinylidene fluoride copolymer 12190-79-3, Cobalt lithium oxide (CoLiO₂)

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(controlled d. of active mass paste layers for electrodes in manufacture of secondary polymer batteries)

L49 ANSWER 17 OF 17 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:653386 HCPLUS Full-text

DOCUMENT NUMBER: 131:259964

TITLE: Compositions and methods for production of lithium secondary batteries using epoxidized soybean oil plasticizers

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PATENT ASSIGNEE(S): Samsung Display Devices Co., Ltd., S. Korea

SOURCE: Ger. Offen., 8 pp.

CODEN: GWXXBX

DOCUMENT TYPE: Patent

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FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19915394	A1	19991007	DE 1999-19915394	199904 06
GB 2336239	A	19991013	GB 1999-7842	199904 06
JP 11329412	A	19991130	JP 1999-98255	199904 06
JP 3928167	B2	20070613		
PRIORITY APPLN. INFO.:			KR 1998-12036	A 199804 06

OTHER SOURCE(S): MARPAT 131:259964

AB Battery electrodes for lithium secondary batteries are manufactured from active films laminated with current collectors (Al, Cu foils), using electrode active materials (LiCoO₂, LiMn₂O₄, graphite), elec. conductors (carbon black),

binders (PVDF), and **plasticizers**, where the **plasticizer** is an epoxidized soybean oil.

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(**cathodes**; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer

RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)

(separators; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

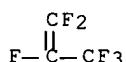
RN 9011-17-0 HCAPLUS

CN 1-Propene, 1,1,2,3,3,3-hexafluoro-, polymer with 1,1-difluoroethene (CA INDEX NAME)

CM 1

CRN 116-15-4

CMF C3 F6



CM 2

CRN 75-38-7

CMF C2 H2 F2



IC ICM H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 37

ST lithium secondary battery epoxidized soybean oil **plasticizer**

IT Fluoropolymers, uses

RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)

(binders; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT Battery anodes

Battery **cathodes**

Plasticizers

(epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT Carbon black, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT Soybean oil
RL: NUU (Other use, unclassified); USES (Uses)
(epoxidized, **plasticizers**; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT Secondary batteries
(lithium; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT Glycerides, uses
RL: NUU (Other use, unclassified); USES (Uses)
(soya, epoxidized, **plasticizers**; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(anodes; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 24937-79-9
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(binders; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12190-79-3,
Cobalt lithium oxide (CoLiO₂)
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(cathodes; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 21324-40-3, Lithium hexafluorophosphate
RL: NUU (Other use, unclassified); USES (Uses)
(electrolyte; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(foil; grid; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 9002-88-4, Polyethylene
RL: DEV (Device component use); USES (Uses)
(sealing materials; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(separators; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethylcarbonate
872-50-4, N-Methylpyrrolidone, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvents; epoxidized soybean oil **plasticizers** for production of lithium secondary battery)